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PREDICTORS OF PERFORMANCE ACHIEVEMENT
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A DISSERTATION APPROVED FOR THE
SCHOOL OF MUSIC

BY

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Dedication

One of my earliest and most diligent educational supporters was my paternal grandmother, Florence Emily (Crane) Ablard. Her and her mother, Lizzie (Hart) Crane, were both teachers in one-room schoolhouses in rural North Central Kansas in the early part of the 1900s. It is with great love and gratitude that I dedicate this dissertation to her memory.

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Abstract

The purpose of this study was to determine which of the following variables best predict the performance achievement of young piano students ranging from ages 8-13: (a) self-assessment from recall immediately following a live piano performance (recall group), (b) self-assessment while watching a video recording immediately following a live piano performance (video group), (c) age, (d) gender, and (e) years of piano study. Participants ($N = 184$) were piano students from Iowa and Oklahoma, ranging in age from eight to thirteen who were divided into a recall group ($n = 92$) and a video group ($n = 92$). During the 2015-2016 academic year, student participants and a panel of experts completed assessments on the researcher designed Bronson Piano Performance Achievement Rubric (BPPAR). The BPPAR included the following criteria: (a) notes, (b) rhythm and timing, (c) articulation, (d) dynamics, and (e) style and mood.

Results of the simultaneous multiple regression analyses indicated the variable of self-assessment ($p < .001$) was found to be a statistically significant predictor of piano performance achievement within both the recall and video groups. Furthermore, gender ($p < .05$) was found to be a statistically significant predictor of piano performance achievement within the video group.

The findings of this study contribute to the current music education literature by (a) providing young pianists, piano teachers, and future researchers with a rubric that effectively measures piano performance achievement, (b) supporting the inclusion of self-assessment practices within private piano studios, and (c) supporting the practice of video recording musical performances to more accurately self-assess performance achievement.

Chapter 1

Introduction

One of the foremost goals for music educators is to create lifelong, independent musicians. For this to occur, it is imperative to develop a child's inherent drive to learn by focusing on the primary aspects of achievement. When children achieve success, they are intrinsically motivated to persist in their musical learning and pursue more challenging work (Stipek & Seal, 2001). If the learning process is successful, students are able to demonstrate mastery of various technical and music performance achievement standards. On-going assessment is an integral part of helping students to develop these achievement standards (Barry, 2009/2010).

Self-assessment with the aid of an evaluation measure such as a rubric provides students autonomy when assessing their performances. It is a valuable skill that can aid students in developing their (a) musical comprehension (b) artistic sensitivity, and (c) essential critical-listening abilities (Burrack, 2002). When engaged in the process of self-assessment, students compare their musical performances to (a) criteria learned from their teacher (b) their previous performances, and (c) exemplary performance models. This process allows students to examine their musical growth and create new learning goals (Oare, 2011; Scott, 2012).

The ability to accurately self-assess one's performance is especially important within the piano studio, as students typically see their teacher once a week for a 30- to 60-minute lesson. During the remainder of the week, students are primarily responsible for (a) evaluating the accuracy and musical quality of their playing, (b) deciding on

learning goals, and (c) employing effective practice strategies to improve the overall performance.

Given the importance self-assessment can play in the learning process of young musicians, it is important to note that piano students must monitor numerous stimuli during their performance, which may reduce their ability to listen in an attentive manner. Bower and Hilgard (1981) explained this phenomenon through Sensory Blocking Theory, which involves the concept of selective attention. This theory postulates that humans are able to focus on select senses, while ignoring others. A young piano student, who lacks the automaticity that comes with years of practice, must monitor a multitude of incoming sensory information. This information is primarily associated with motor skills, and includes (a) correct arm, hand, and finger position; (b) fingering; (c) note accuracy; (d) accurate rhythm, tempo, and timings; (e) moving at the appropriate time; (f) articulations; (g) dynamics; and (h) expression. As a result, adequate attention may not be given to the important aural sound being produced.

In order to become a comprehensive musician, it is imperative that young piano students are taught to develop their ability to listen critically through the process of self-assessment. When used correctly, self-assessment can be a highly effective learning strategy, but the process can be challenging for younger students. In addition, previous research has indicated that age (Hewitt, 2005, 2010; Ross, Rolheiser, & Hogaboam-Gray, 2002), gender (Andrade & Boulay, 2003; Goodrich, 1996; Ross, Rolheiser, & Hogaboam-Gray, 2002), and years of study (Camilli, Hewitt, 2005, 2010;) might also have an impact on performance achievement. Determining what variables best predict young pianists' performance achievement could help private studio teachers develop

better learning environments. Furthermore, the results derived from such a study could help young students to develop effective practice strategies.

Background

Self-Assessment

Bandura (1991) asserts that all humans have *self-reflective* and *self-reactive* capabilities that allow them to have control over their “thoughts, feelings, motivations, and actions” (p. 249). These inherent tendencies have been studied under a variety of titles such as self-reflection, self-evaluation, and self-observation. In order for independent practice time to be valuable, young pianists need strategies to promote effective self-assessment practices. Riley (2007) suggests that it is beneficial for pianists to listen to their recorded performances for the purposes of self-assessment. This process allows students to clearly focus on how they truly sound. In addition to helping students develop their critical listening skills, recorded performances can be used to create a portfolio in which students can chart their long-term progress. Hale and Green (2009) advocated having band and choir students record their individual performances three times throughout the school year to create a recorded performance portfolio. These performance logs can serve as concrete evidence of musical progress, which can motivate students to further develop their playing abilities.

Burrack (2002) asked a sample of middle school band students to record and self-assess their solo performances. Through this process, students reported that they (a) developed a deeper musical understanding by completing the self-assessments, (b) felt motivated to practice challenging portions of the music, (c) developed their critical listening skills, and (d) felt responsible for their own learning. Moreover, the

measurement tool provided students with specific performance criteria in which to assess their performance.

Self-Assessment and Children in General Education

Brookhart, Andolina, Zuza, and Furman (2004) found that self-reflection helped third-grade math students turn the learning of multiplication skills from a rote memory task into a deeper cognitive understanding. Schunk (1996) discovered that self-evaluation correlated positively with the number of completed math fraction problems, students' self-efficacy, and persistence. When performing a series of mathematical problem solving tasks, a group of fifth- and sixth-grade students who completed self-evaluations after rubric training outperformed a group of students who did not undergo such training (Ross, Hogaboam-Gray, & Rolheiser, 2002).

Training with rubrics also yielded positive results for elementary students when writing narrative stories (Ross, Rolheiser, & Hogaboam-Gray, 1999). Students who were instructed in using a writing rubric (a) produced more accurate self-evaluations and (b) wrote higher quality compositions when compared to students who did not participate in self-evaluation training.

Ross et al. (2002) found the application of self-evaluation practices in the general elementary classroom helped students to (a) be more successful in school, (b) give them a sense of ownership over their work, (c) help clarify their teacher's expectations, (d) provide an opportunity to make evaluative decisions with their teacher, and (e) allow them to set on-going goals. It was further discovered that students preferred self-evaluations to teacher-evaluations.

Self-Assessment in Music Education

Self-assessment has been the focus of study for a substantial amount of research within music education. Kostka (1997) investigated self-assessment within a university level group piano class for non-keyboard majors and discovered a significant correlation existed between students' perceived ability and their self-assessment. Kostka suggested that the use of specific rating criteria enhanced the self-assessment process for keyboard students. The results of this study further demonstrate the need to develop rubrics for young pianists for the purpose of self-assessment. Doing so might help students to further develop their musical achievement.

Several studies have explored the effectiveness of self-assessment within the band classroom. Sparks (1990) examined the effect of self-assessment on the musical achievement of fifth-grade instrumentalists. Results indicated the treatment group improved on every performance criterion, with the most marked increase on pitch and technique. In addition, scores from the control group declined slightly. Morrison, Montemayor, and Wiltshire (2004) studied the effect of modeling in conjunction with self-assessment among middle and high school band students. High school students' self-evaluations of pieces learned without an exemplary performance model were evaluated more highly than pieces learned with the aid of an audio performance recording. The researchers concluded that listening to the audio recording provided high school students with a consistent model in which to compare their own performances.

Davis (1981) discovered that middle school band students who participated in a combination of structured singing activities and self-evaluation of their instrumental

performances exhibited the highest scores on the following variables: (a) prepared playing, (b) sight-reading, and (c) attitude. It is also worth noting that the lowest band dropout rate came from students who self-evaluated their performances.

Napoles (2008) studied the relationships between instructor, peer, and self-evaluations within an undergraduate choral methods class. Results indicated students' self-evaluations (a) correlated poorly with their instructor and (b) the comments did not agree with those of their instructor or peers. Interestingly, students recalled the comments of their peers more often than their instructor's comments. In light of this finding, as younger students' evaluations are often inaccurate, piano instructors should provide guidance when allowing students to receive feedback from their peers.

Self-Assessment Following a Live Performance Compared to Listening to an Audio Recording

When compared to error detection practices following the live performance, Kepner (1986) found that middle school and high school students recognized more errors while listening to an audio recording of their performance. Kepner believed that using a recording allowed students to listen critically, without the physical demands of performing. Using a sample of middle school students, Bundy (1987) discovered that self-assessment of pitch error detection was more accurate in the live mode, while rhythm errors were detected more accurately while listening to the recording. Bundy concluded the results were in alignment with previous motor learning research, which has found that the kinesthetic sensations provide longer lasting information compared to the aural senses.

During a rehearsal following a concert, collegiate choir students were asked to rate their best, worst, and favorite pieces of the concert performance from memory (Robinson, 1993). During the second rehearsal following the concert, students were asked to rate their best, worst, and favorite pieces of the concert performance while listening to a recording of their concert. No significant differences were found between the evaluations. According to Robinson, participants' best, worst, and favorite concert piece may have been set decisions, regardless of evaluation condition.

In a similar study, Rowher (1996) instructed half of the students within a collegiate choir to evaluate their performance from recall 18 hours after their concert, while the other half of the choir was asked to evaluate their performance while listening to an audio recording of the concert. Again, no significant differences were found between the evaluations representing both groups, except students who listened to the recording were more critical in the areas of dynamics and tempo. The previous research demonstrates the importance of (a) controlling the time lapse between the performance and self-assessment, (b) the effectiveness of the evaluation tool, (c) participants' understanding of the evaluation tool prior to assessment, and (d) attention to the measure during self-assessment.

Self-Assessment While Listening to an Audio Recording

When creating a model to predict jazz improvisation achievement, Ciorba (2006) discovered that self-assessment had a large direct effect on jazz improvisation achievement. Byo and Brooks (1994) found seventh- and eighth-grade band students to be somewhat objective towards the self-assessments of their audio performances. While participants' evaluations were inflated, they did mirror the evaluations of experts

when recorded on a Continuous Response Digital Interface (CRDI) dial. High school instrumentalists' musical self-esteem improved through the combination of immediate self-listening to an audio recording of their performance while completing a self-evaluation (Zimmerman, 2005). It is hoped that student self-assessments through recordings can be an effective learning tool for young pianists.

Self-Assessment While Viewing a Video Recording

Oare (2007) reported that students frequently lacked specificity within their practice. In response, it was suggested the students should have clear performance criteria when engaged in the process of self-assessment. This allows students to have a degree of control over their own assessment. In addition, self-assessment may help students to relate their triumphs or failure to personal effort. These results yielded promising implications for the current study.

The relationships between faculty, peer, and self-evaluations of university jury performances were the focus of two studies conducted by Bergee (1993, 1997). Results from both studies found that faculty and peer evaluations correlated closely, while self-evaluations related poorly with those of the faculty and their peers. Additionally, Bergee noted that the faculty members' familiarity with students did not affect evaluations.

Furman (1987) discovered that university students enrolled in a beginning guitar course displayed the highest performance scores when they utilized a self-assessment behavior checklist while watching a video recording of their performance. Music therapy majors increased their positive teaching behaviors after completing self-assessments while viewing their teaching videos (Alley, 1980). Similarly, Benson

(1989) found violin instructors improved their teaching behaviors after completing self-assessments while viewing video recordings of their lessons. Yarbrough (1987) also reported that undergraduate students in an introductory conducting course increased their conducting behaviors following self-critiques of their practice videos.

Napoles & Bowers (2010) found that music education majors enrolled in a choral techniques class were more successful at integrating specific reinforcements into their teaching following the self-analysis of their teaching video, when compared to students who only received instructor feedback. The researchers proposed that self-analysis might be a viable alternative to instructor feedback.

Age as a Predictor of Performance Achievement

Using a rubric to guide the classroom self-evaluations of second-, fourth-, and sixth-grade students, Ross, Rolheiser, and Hogaboam-Gray (2002) found that participants displayed increased assessment sophistication as they aged. When compared to younger participants, it was discovered older students (a) understood the rubric on a deeper level, (b) stated with greater clarity the specific areas that needed improvement, (c) were more likely to devise action plans for future learning, and (d) interpreted lower scores as an indication to increase their effort. Additionally, Ross et al. found that older students shared and discussed their evaluations with their peers, while younger students were more likely to seek help from their parents. These findings indicate that younger piano students may benefit the most from the guidance of their parents and teachers while evaluating their performances. Older students, however, may gain the most from teacher-supervised peer discussions of evaluations within a group piano class.

Hewitt (2005) found that older band students were more critical when self-assessing their performances. High school participants displayed the greatest accuracy on the following performance criteria: (a) tone, (b) intonation, (c) tempo, (d) interpretation, and (e) technique/articulation. Middle school students were more accurate when assessing melody and rhythm. All participants exhibited higher self-assessment scores when compared to the scores derived by a panel of experts. The greatest disparity occurred among the self-evaluations of the youngest students. When examining the self-assessment procedures among a sample of fifth- through eighth-grade band students, Hewitt (2010) discovered the greatest improvement in performance scores occurred within the youngest grade level.

Gender as a Predictor of Performance Achievement

Goodrich (1996) found that seventh-grade girls who completed a scientific task and self-assessed their abilities using a rubric displayed greater metacognitive thinking skills compared to girls who did not engage in the process of self-assessment. Additionally, while self-assessment displayed a positive impact on the metacognition of the female participants, it appeared to have a negative impact on the male students. It was discovered that girls were more likely to attribute their achievement to effort and self-regulation, while boys were more likely to ascribe their success to ability (Dweck & Bush, 1976; Dweck, Davidson, Nelson, & Enna, 1978).

Andrade & Boulay (2003) implemented training sessions among a sample of seventh- and eighth-grade students to determine if self-assessment practices using a detailed rubric could have a positive effect when writing historical essays. Results indicated that rubric training sessions had a significant and positive effect for the

writing process among the female students, but not so for the male students. The researchers stated the results were in alignment with previous studies that found girls were more extrinsically motivated than boys (Deci & Ryan, 1980; Dweck & Bush, 1976; Dweck et al., 1978; Hollander & Marica, 1970).

Ross, Rolheiser, and Hogaboam-Gray (2002) revealed interesting findings among a sample of elementary students who utilized rubrics when self-evaluating their classroom work. When compared to male participants, female participants were much more likely to (a) share their self-evaluations with their peers, (b) compare their current self-evaluations with previous assessments, (c) demonstrate understanding of the evaluation interpretations, (d) share specific plans for using the self-assessments to shape future learning, and (e) report that self-assessment while using a rubric benefited their school progress.

Years of Study as a Predictor of Performance Achievement

When examining variables that best predict piano students' length of piano study, Camilli (2010) concluded that piano students perceived their parents' cognitive support as a factor that might inhibit their independence. It was further stated that high-achieving piano students become more autonomous in their work, which increases their motivation to practice. It is important to note for the current study that student self-assessment using a detailed rubric may allow piano students to have a desired level of autonomy in their musical studies.

In a 2005 study, Hewitt sought to discover if differences existed among grade levels in the areas of assessment accuracy and assessment tendencies. High school participants were found to be the most accurate self-assessors of every subarea except

melody and rhythm, while middle school students' self-assessments correlated more closely with experts on these two subareas. Additionally, both age groups were most accurate on the self-assessment of melody and least accurate on technique/articulation. It was also found that all students exhibited higher self-assessment scores than the experts, with the greatest differences occurring among middle school participants, which Hewitt suggested might demonstrate that high school students may be more critical of their musical performances. In a later study, Hewitt (2010) discovered that fifth-grade performance scores increased in all the performance subareas, while the sixth-, seventh- and eighth-grade levels showed less consistent improvement. Hewitt concluded that middle school students might need additional time to become effective evaluators of their performances.

Music Performance Achievement

Music performance achievement will serve as the dependent variable in the current study. Previous research has shown that one of the most effective ways to measure music performance achievement is through the use of a rubric. Rubrics are highly effective tools for assessment as they provide (a) concrete achievement levels, (b) detailed criterion descriptions that can be used to improve future performances, (c) a learner-centered approach to assessment, (d) documentation of student achievement, and (e) a means to clearly implement and evaluate performance standards (Wesolowski, 2012).

Rubrics

Rubrics can serve as a valuable learning tool to guide students' self-assessment of their musical performances. The multiple components of a detailed rubric include (a)

appropriate performance criteria, (b) specific levels for achievement and (c) detailed descriptors that help students isolate their strengths and weaknesses (Wesolowski, 2012). The key characteristics of a detailed rubric are the detailed descriptors, which outline a range of comprehensive achievement levels for each performance criteria (Asmus, 1999). Furthermore, these descriptors help students understand what they need to do to improve their performance in the future. The performance descriptors need to be written in a clear and concise manner using age-appropriate language, and the language used for the descriptors should aim for continuity among the performance achievement levels (Wesolowski, 2012).

Rubrics can be more clearly defined by their assessment application. A task specific rubric is utilized for the assessment of a single task, such as the performance of a specific Bach Minuet. A generic rubric, however, can be used to assess a wide range of performances, such as any of the Bach Minuets, as well as other piano repertoire pieces (Asmus, 1999).

Rubrics Used to Assess Achievement in General Education

Bobbette (1999) found that a descriptive rubric successfully guided teaching applicants in designing their portfolios. Self-evaluation using a writing rubric, along with evaluation training, helped elementary students to compose higher quality stories, as compared to students who did not receive assessment training (Ross, Rolheiser, & Hogaboam-Gray, 1999). Similarly, Andrade and Boulay (2003) found that self-evaluation training on how to use a writing rubric resulted in a significant and positive effect for female junior high participants' essay scores. Elementary students who utilized a rubric to self-assess their classroom work reported that the detailed descriptors

helped them to recognize areas in which they excelled and needed to improve (Ross, et al., 2002).

Rubrics Used to Assess Achievement in Music Education

Bergee (1987, 1993, 2003, 2010) has worked extensively with the development of music assessment tools. Beginning in 1987, Bergee created the Euphonium-Tuba Performance Rating Scale. This scale contained four performance factors, which included 27 descriptive performance statements that were paired with a five-point Likert-type scale. Analysis of the results indicated the rating scale exhibited high inter-judge reliability. In a later study, Bergee (1993) utilized the Brass Performance Rating Scale to evaluate university brass jury performances. Additional performance rating scales were developed by Bergee (2003) to evaluate university instrumental and vocal juries. Bergee concluded that the rating scale's comprehensive detailed descriptors helped the faculty evaluators to give attention to all performance aspects, which subsequently provided valuable feedback to the student performers. Similarly, Ciorba and Smith (2009) used a multidimensional rubric to assess undergraduate vocal and instrumental juries. Results of a MANOVA indicated significant differences in rubric scores according to the participants' year in college, indicating that a multidimensional assessment rubric can effectively measure music performance achievement.

Latimer, Bergee, and Cohen (2010) developed a multidimensional performance rubric to evaluate high school orchestra, band, and choir performances. The rubric, which was created by 14 experts, contained eight detailed performance criteria that were aligned with five achievement levels. The rubric was deemed to (a) be internally consistent and (b) contain pedagogical value. In a similar study, Saunders and Holahan

(1997) utilized the Woodwind/Brass Solo Evaluation Form to evaluate high school All-State band students' performances. The seven performance criteria were paired with eleven continuous rating scales. The form proved an effective tool in providing valuable performance feedback to students.

High school instrumentalists within a private studio utilized a rubric containing five-performance criteria to complete self-evaluations while listening to a recording of their performance (Zimmerman, 2005). Results indicated that students' musical self-esteem increased throughout the study. Norris and Borst (2007) reported that a choral festival performance rubric that used specific criteria provided stricter adjudication ratings when compared to a traditional rating form.

Need for the Study

Self-assessment has been the focus of a substantial amount of research. It has been successfully utilized in general education to enhance performance achievement of children learning multiplication tables (Brookhart, Andolina, Zuza, & Furman, 2004), writing essays (Andrade & Boulay, 2003), writing narrative stories (Ross, Rolheiser, & Hogaboam-Gray, 1999), mathematical problem solving (Ross, Hogaboam-Gray, & Rolhesier, 2002), and creating an arthropod classification system (Goodrich, 1996). Additionally, self-assessment has been shown to increase self-efficacy, skill development, motivation, and persistence among students learning mathematical fractions (Schunk, 1996). Self-assessment also provided students a sense of ownership over their classroom work (Ross, Rolheiser, & Hogaboam-Gray, 2002).

Self-assessment in music education has been conducted among band students with (Hewitt, 2001, 2002, 2005, 2010; Morrison, Montemayor, & Wiltshire, 2004) and

without (Aitchison, 1995; Byo & Brooks, 1994; Davis, 1981; Oare, 2007; Sparks, 1990; Zimmerman, 2005) the aid of a performance model. Comparisons of faculty, peer, and self-evaluations of performance juries were studied by Bergee (1993, 1997), while Napoles (2008) compared the relationship of these evaluations in teacher training.

The accuracy of self-assessment from recall compared to self-assessment while listening to an audio recording has been studied with band students (Bundy, 1987; Kepner, 1986) and choir students (Robinson, 1993; Rowher, 1996). Self-assessment using an audio recording was found to have a direct effect on jazz improvisation achievement (Ciorba, 2006). Similarly, self-assessment while watching a video with the guidance of an assessment tool was found to increase the performance skills of guitar students (Furman, 1987), beginning conductors (Yarbrough, 1987), and enhance teacher effectiveness training of music therapy majors (Alley, 1980), undergraduate students in a music methods course (Cassidy, 1993; Colwell, 1995), violin instructors (Benson, 1989), and music education majors (Napoles & Bower, 2010).

Age has also been studied as a predictor of performance achievement with students in the general classroom (Ross, Rolhesier, & Hogaboam-Gray, 2002) and instrumental music classroom (Hewitt, 2005, 2010). Gender was found to predict performance achievement with students when (a) completing a scientific task (Goodrich, 1996), (b) composing historical essays (Andrade & Boulay, 2003), and (c) using rubrics to evaluate classroom work (Ross, Rolhesier, & Hogboam-Gray, 2002). In addition, years of study (a) served as a dependent variable when studying private piano students (Camili, 2010) and (b) was applied to determine if significant differences existed among a sample of band students (Hewitt, 2005, 2010).

Previous research has also investigated the effectiveness of rubrics when evaluating undergraduate instrumental and vocal performance juries (Ciorba & Smith, 2009), high school instrumentalists who studied music privately (Zimmerman, 2005), and high school orchestra, band, and choir performances (Latimer, Bergee, & Cohen, 2010).

While previous research has contributed significantly to the area of music performance achievement, a need exists to study the following independent variables as predictors of piano performance achievement: (a) self-assessment from recall immediately following a live piano performance, (b) self-assessment while watching a video recording immediately following a live piano performance, (c) age, (d) gender, and (e) years of piano study. It is hoped the results of this study can help private piano teachers develop effective learning environments, which promote student autonomy and achievement.

Purpose of the Study

The purpose of this study was to determine which of the following variables best predict the performance achievement of piano students ranging from ages 8-13: (a) self-assessment from recall immediately following a live piano performance (recall group), (b) self-assessment while watching a video recording immediately following a live piano performance (video group), (c) age, (d) gender, and (e) years of piano study.

Research Questions

1. What are the descriptive statistics of the sample as represented by the Bronson Piano Performance Achievement Rubric (BPPAR)?
2. What are the interrelationships among the following variables: (a) self-

- assessment from recall immediately following a live piano performance (i.e., the recall group), (b) age, (c), gender, and (d) years of piano study?
3. What are the interrelationships among the following variables: (a) self-assessment while watching a video recording immediately following a live piano performance (i.e., the video group), (b) age, (c), gender, and (d) years of piano study?
 4. Which of the following variables best predict the performance achievement of piano students ages 8-13: (a) self-assessment from recall immediately following a live piano performance (recall group), (b) age, (c), gender, and (d) years of piano study?
 5. Which of the following variables best predict the performance achievement of piano students ages 8-13: (a) self-assessment while watching a video recording immediately following a live piano performance (video group), (b) age, (c), gender, and (d) years of piano study?
 6. What are the participants' thoughts and suggestions on using the BPPAR for the purpose of self-assessment?

Definitions

1. Expert Assessment: The assessment of piano experts derived from watching recordings of student performances and as measured by the BPPAR.
2. Recall Group: A sample of young students who will complete a self-assessment procedure from recall immediately following a live piano performance.

3. Video Group: A sample of young students who will complete a self-assessment procedure while watching their video recording immediately following a live piano performance.

Operational Definitions

1. Self-Assessment is operationally defined by student scores derived from the BPPAR.
2. Piano performance achievement is operationally defined by expert scores derived from the BPPAR.

Limitations

1. The sample representing this study was limited to 8-13 year-old piano students ($N = 184$) within Iowa and Oklahoma who studied piano in a private studio setting during the 2015-2016 academic year.

Chapter 2

Review of Literature

Previous research has indicated that self-assessment, age, gender, and years of study can be effectively used as predictors of performance achievement. As such, this chapter will address the previous research findings and their implications to the current study. Additionally, the current study included the creation and administration of a rubric, which measured the variables of self-assessment and performance achievement. As such, research that has addressed the topics of rubric creation and assessment will also be reviewed.

Self-Assessment in General Education

Self-assessment is a necessary and ongoing life process that allows people to monitor and evaluate current tasks in order to shape future actions. As a research topic, it has been studied in numerous educational settings under a variety of titles such as self-assessment, self-evaluation, self-observation, and self-reflection. Brookhart, Andolina, Zuza, and Furman (2004) successfully utilized self-assessment to help third-grade math students ($N = 41$) develop their multiplication skills. The researchers desired to convert participants' learning process from rote memory into a deeper cognitive understanding through the aid of self-reflection. After a week of guided instruction and practice, each student completed a reflection sheet to determine (a) if they had met their previous week's math goal, (b) what learning strategies had been used, (c) if the strategies were successful, and (d) what strategies should be utilized in the upcoming week. Results indicated that students were able to predict their perceived math achievement with increased accuracy as the study progressed. It was concluded that

self-reflection helped students successfully learn their multiplication times tables, but the researchers emphasized that the process needed to be taught and guided by the instructor.

Schunk (1996) investigated how self-evaluation impacted motivation and achievement outcomes among a group of fourth-grade students ($N = 44$) when learning mathematical fractions. According to Schunk, learning goals focus on the process of solving a problem, while performance goals focus on arriving at a correct answer. Participants were equally divided among four experimental conditions: (a) learning goals with self-evaluation, (b) learning goals without self-evaluation, (c) performance goals with self-evaluation, and (d) performance goals without self-evaluation.

Results indicated that self-evaluation correlated positively with (a) the number of completed problems ($r = .55$), (b) students' self-efficacy ($r = .74$), and (c) persistence ($r = .77$). Using a multivariate analysis of covariance (MANCOVA), it was determined that self-evaluation ($F(3, 35) = 4.92, p < .01$) had a significant effect on self-efficacy, skill, and persistence. Schunk concluded that the process of self-evaluation helped students to understand the skills they gained while bolstering their self-efficacy. Additionally, self-evaluation needs to occur under the guidance of teacher instruction to be truly effective. Doing so may help students to recognize their acquired skills and progress.

Ross, Hogaboam-Gray, and Rolheiser (2002) sought to determine if self-evaluation training impacted mathematics achievement among a sample of fifth- and sixth-grade students. Participants were divided into a self-evaluation training treatment group ($n = 259$) or a control group ($n = 257$). A pre- and post-test consisting of

mathematical problem solving tasks was administered to both groups. Following the pre-test, students ranked their performance on a ten-point scale from (1) not well to (10) very well. Participants additionally used the same ten-point scale to determine how well they (a) understood the problem, (b) made a plan, (c) solved the problem, (d) checked the solution, and (e) explained the solution. Two expert teachers then coded students' problem solving tasks using a rubric comprised of the following criteria: (a) strategy for generating a solution, (b) accuracy of concepts and computations, and (c) communication of solution.

Over the course of the study, students also completed a six-item self-efficacy measure and a ten-item self-evaluation measure. Students within the treatment group additionally participated in six 30-minute lessons in which the teacher (a) demonstrated various self-evaluation techniques and (b) discussed students' self-evaluations. During one training session, the teacher guided the treatment group to cooperatively develop a rubric for one of their mathematical problem solving tasks. Results indicated the treatment group outperformed the control group on mathematical problem solving tasks. It was concluded that the self-evaluation training had a positive impact on mathematics achievement. Additionally, self-evaluation procedures might serve as valid alternatives to the traditional short-answer math tests.

Ross, Rolheiser, and Hogaboam-Gray (1999) also investigated self-evaluation practices of students when writing narrative stories. A sample of fourth-, fifth-, and sixth-grade students ($N = 296$) was divided into a treatment group and a control group. After receiving self-evaluation training, teachers representing the treatment condition demonstrated and discussed self-evaluation with their students while working together

to define criteria for a writing rubric. The treatment group subsequently utilized the rubric for 12 practice writing sessions. Teachers in the control group did not attend self-evaluation training and did not train their students how to self-evaluate their narrative stories. For the pre- and post-test, all participants wrote short narrative stories and then immediately completed the self-evaluation rubric. Results indicated that students representing the treatment group were more accurate when self-assessing their narrative stories. In addition, the writing quality was higher for students representing the treatment group, indicating that self-evaluation might be a beneficial tool for increasing student achievement.

Ross, Rolheiser, and Hogaboam-Gray (2002) continued their self-assessment research by seeking to understand (a) how students process evaluative information and (b) how this information influences their thought processes. A sample of second, fourth, and sixth grade students ($N = 71$) participated in the three-month study. Participants and their teachers developed rubrics in a cooperative manner. Participants were then instructed how to utilize the rubrics for evaluating their classroom work. Additionally, teachers (a) gave students feedback on their self-assessment accuracy and (b) assisted students in setting learning goals.

Participants were also asked a series of questions pertaining to the evaluation process. Results of the interviews indicated that positive comments regarding the self-evaluation process greatly outweighed the negative remarks. Furthermore, 67 of the 71 participants expressed that self-evaluation of their work helped them to be more successful in school. Lastly, students claimed that self-evaluation (a) gave them a sense of ownership over their work, (b) helped to clarify their teacher's expectations, (c)

provided them the opportunity to participate in evaluative decisions with their teacher, and (d) allowed them to set ongoing self-improvement goals. Overall, students preferred self-evaluation when compared to teacher-evaluation.

Self-Assessment in Music Education

In the field of music education, self-assessment has been studied among a broad range of age groups, although very little research has focused specifically on self-assessment with young pianists. Kostka (1997) utilized a pre- and post-test design among a sample of undergraduate non-piano music majors ($N = 32$) enrolled in a piano class to determine the effects of self-assessment when knowing and valuing keyboard skills. Participants were asked to rank the value of (a) hand position, (b) sight-reading ability, (c) accurate fingering, (d) musicality, and (e) technique. Each skill was then expanded upon over a two-week instructional period. After each teaching unit, participants were asked to self-assess their keyboard ability. At the conclusion of the 15-week study, students completed the post-test questionnaire. Post-test results indicated a significant correlation existed between participants' self-assessment and perceived ability.

Sparks (1990) explored the effectiveness of self-assessment among beginning fifth grade band students ($N = 57$). The experimental group completed daily self-evaluations on their (a) tone, (b) pitch, (c) rhythm, (d) technical accuracy of notes, (e) playing position, and (f) time spent practicing. The control group did not complete the self-assessment tasks. Rather, they only received feedback from the teacher. Individual and group performances were assessed at the beginning, middle, and end of the study to measure performance achievement. Mean score differences revealed the self-

assessment group improved on every criterion, especially on pitch and technique, while the mean scores of the control group declined slightly. In addition, Sparks had each group complete a pre- and post-attitude questionnaire. Results indicated that participants from the experimental group displayed a positive increase in their attitude towards music, while those in the control group showed no change. Sparks suggested that self-assessment might benefit students' musical achievement and attitude.

Morrison, Montemayor, and Wiltshire (2004) studied the effectiveness of self-assessment in conjunction with performance models. Three middle school bands and two high school bands learned two pieces of equal difficulty. Each band was provided with a professional audio recording of one of the two pieces to serve as an example of model performance. Band directors were given instructions on how to incorporate the model recording into their rehearsal. After one week of rehearsal, each band recorded both pieces, which would serve as the pre-treatment recordings. The pieces were performed again at the end of the five-week study to serve as the post-treatment recording. Additionally, all students completed guided self-evaluations, which included five questions designed to assess (a) notes and rhythms, (b) articulation and dynamics, (c) intonation, and (d) balance. Five expert instrumental music instructors evaluated the pre- and post-treatment recordings.

ANOVA results indicated no significant difference between the performance achievement of model and no-model treatments. However, results further indicated that students' self-evaluations of the no-model pieces were consistently higher than their evaluations of the model pieces. Morrison et al. suggested that the recording might

have given the high school students a consistent model in which to compare their own performance.

Hewitt (2001) similarly studied the effects of performance models and self-assessment among seventh- through ninth-grade woodwind, brass, and percussion students ($N=82$). This experimental study included eight treatment groups, utilizing various combinations of self-assessment, performance models, and self-listening. All students were trained using the Woodwind/Brass Solo Evaluation Form, which uses a five-point criteria-specific rating scale developed by Saunders and Holahan (1997). The performance criteria consisted of (a) tone, (b) intonation, (c) technique/articulation, (d) melodic accuracy, (e) rhythmic accuracy, (f) tempo, and (g) interpretation.

Participants who listened to a model and completed self-assessments immediately following their performance showed improvement in the areas of (a) tone, (b) melodic and rhythmic accuracy, (c) interpretation, and (d) total performance. Hewitt stated that in order for independent learning to take place, teachers needed to include (a) a method for self-assessment and (b) accurate performance models for students to compare to their own performance.

Hewitt (2002) continued to investigate (a) self-evaluation accuracy with or without the use of a model performance and (b) the relationship between performance achievement and self-evaluation accuracy. A sample of junior high band students ($N=41$) was trained using the Woodwind/Brass Solo Evaluation Form (Saunders & Holahan, 1997). Over the course of a six-week study period, students in the model treatment group listened to the audio recording of the music prior to practice. Following each performance, all of the student participants completed the

Woodwind/Brass Solo Evaluation Form. A panel of experts also evaluated the participants' performances.

Results indicated the self-evaluation accuracy of students within the model group and no-model group did not significantly improve from the pre- to post-test. In addition, self-evaluation scores on intonation accuracy actually decreased. Pearson correlations indicated moderately positive relationships between the (a) model group and experts for the performance subarea of tempo ($r = .46$) and (b) model/no model groups and experts for interpretation ($r = .34$). Additionally, students' self-evaluation scores were higher than the experts' scores. Hewitt concluded that providing junior high band students with a model performance in addition to a self-evaluation form did not increase their self-evaluation accuracy and that band directors need to systematically guide students on their self-evaluations.

In a 2005 study, Hewitt sought to discover if differences existed among grade levels in assessment accuracy and assessment tendencies within the music performance subareas of (a) tone, (b) intonation, (c) melody, (d) rhythm, (e) tempo, (f) interpretation, and (g) technique/articulation. Participants ($N = 143$) were middle and high school brass, woodwind, and percussion instrumentalists attending a six-day long summer music program. Students assessed their performances using a modified Woodwind/Brass Solo Evaluation Form (Saunders & Holahan, 1997). Three expert judges completed this same evaluation form while they listened to recordings of participants' performances.

High school participants were found to be the most accurate self-assessors of every subarea except melody and rhythm, while middle school students' self-

assessments correlated more closely with experts on these two subareas. Additionally, both age groups were most accurate on the self-assessment of melody and least accurate on technique/articulation. Lastly, all students exhibited higher self-assessment scores than the experts, with the greatest differences occurring among middle school participants, which Hewitt suggested might demonstrate that high school students may be more critical of their musical performances.

Hewitt (2010) continued to study self-evaluation by seeking to learn if instruction in self-evaluation would impact middle school instrumentalists' music performances and self-evaluation accuracy. A sample of fifth- through eighth-grade students ($N = 211$) who were enrolled at a private middle school were assigned to one of three treatment groups: (a) self-evaluation with instruction, (b) self-evaluation only, and (c) no self-evaluation. Over the course of the five-week study, all treatment groups listened to a model recording and were provided time to practice at each lesson. Students representing the treatment groups completed the modified Woodwind/Brass Solo Evaluation Form immediately following their performances. Additionally, participants in the self-evaluation with instruction group created a rubric with the aid of their teacher. Students representing the self-evaluation with instruction group received a teacher-led discussion of the evaluations following their performances. The teacher also provided individual written feedback for students' self-evaluations.

A multivariate analysis of variance (MANOVA) was performed on the pre- and post-test music performance and self-evaluation scores to determine if any significant differences existed among the treatment groups and grade levels. Results indicated that fifth-grade performance scores increased in all the performance subareas, while the

other grade levels showed less consistent improvement. Results further revealed that self-evaluation plus instruction had little impact on students' self-evaluation accuracy or music performance scores. Hewitt concluded that middle school students might need additional time to become effective evaluators of their performances.

Davis (1981) studied the effect of self-evaluation practice and structured singing activities on elementary instrumentalists' (a) music performance, (b) melodic tonal imagery, (c) self-evaluation of instrumental performance, and (d) attitude toward music. A sample of fifth-grade ($n = 50$) and sixth-grade ($n = 34$) band students were divided among several experimental or control groups for the 38-lesson study. The three experimental conditions were (a) structured singing activities only, (b) self-evaluation practice only, and (c) a combination of structured singing activities and self-evaluation practice. The control condition applied the normal manner of teaching by the participants' band instructor. The student self-evaluation form used a five-point rating scale, which was aligned with the following performance criteria: (a) pitch, (b) breathing and tone quality, (c) rhythm and consistency of tempo, (d) articulation, and (e) dynamics.

Results indicated the experimental group involved in the combination of singing activities and self-evaluation exhibited significantly higher scores on (a) prepared playing, (b) sight-reading, and (c) attitude. Additionally, the singing and self-evaluation groups' scores correlated highly with the experts' evaluations ($r = .77$). Another interesting finding revealed the lowest band dropout percentage came from the participants in the self-evaluation group. Davis concluded that students who

consistently evaluate their performances might discern their assessments at a higher level.

The following study examined the impact of incrementally increased levels of student self-evaluation involvement on the following variables: (a) instrumental performance, (b) self-evaluation accuracy, (c) motivation, and (d) self-esteem (Aitchison, 1995). Seventh- and eighth-grade instrumental students ($N = 84$) were assigned to one of the following evaluation groups: (a) teacher-only, (b) teacher-driven, (c) student-driven, or (d) student-only. Self-evaluation was conducted using the Critical Commentary Scale, which is based on the following performance criteria: (a) rhythm, (b) tempo, (c) interpretation, (d) musical effect, (e) tone quality, (f) intonation, (g) technique, (h) articulation, (i) posture, (j) hand position, and (k) embouchure. When engaged in the self-evaluation process, students were instructed to choose three of the performance criteria to describe (a) what they noticed about their performance, (b) specific measures that were performed well or needed improvement, and (c) necessary revisions and practice strategies.

Results of an analysis of variance (ANOVA) indicated that self-evaluation scores within the student-driven evaluation mode were significantly lower than evaluation scores within the teacher-only evaluation mode. Aitchison suggested that the significant difference could be attributed to students' inability to discuss the evaluation process with their instructor. Furthermore, when participants were asked what evaluation mode they preferred, the majority of students chose the teacher-student interaction modes. It was concluded the self-evaluation process should be taught and monitored at the seventh- and eighth-grade level in order to have a positive impact on

students' instrumental performances. Another important finding revealed significant pre- to post-test improvements for the following variables: (a) self-evaluation ratings, (b) self-evaluation accuracy, (c) intrinsic interest, (d) self-esteem, and (e) critical commentary on the self-evaluation measure. Aitchison further concluded that self-evaluation accuracy improves with experience.

Rather than studying performance assessments, Napoles (2008) studied the relationships between instructor, peer, and self-evaluations of teaching segments. Undergraduate music education majors ($N = 36$) enrolled in general music methods and choral rehearsal technique courses participated in the study. Throughout the semester, each participant completed three microteaching experiences, which were immediately followed by self-assessment procedures. While engaged in the self-assessment process, students were instructed to provide four positive comments and one constructive comment. Participants were also asked to rank their overall teaching effectiveness on a scale of one to ten. Additionally, the previous student presenter completed a peer evaluation, while the instructor completed evaluations for all the students.

Peer and instructor evaluations correlated highly ($r = .74$), while student and instructor assessments correlated poorly ($r = .29$). Additionally, the instructor gave the highest rating for all teaching segments, while the peers gave the lowest. The evaluative comments of the students did not agree with those of their peers or instructor, but students recalled the comments of their peers more often than those of their instructor.

Self-Assessment From Recall Compared to Listening to an Audio Recording

Previous research by Kepner (1986), Bundy (1987), Robinson (1993), and Rohwer (1996) are of special interest to the current study, as they explored the process of self-assessment from recall, compared to self-assessment completed while listening to an audio recording. Kepner (1986) measured the self-assessments of seventh-through twelfth-grade band students ($N = 50$) on their error detection accuracy of (a) pitch, (b) rhythm, (c) articulation, (d) tempo, (e) dynamics, and (f) intonation using live performance and audio recordings. Over the course of a week, participants were taught the first eleven performance excerpts from Form B of the Watkins-Farnum Performance Scale (Watkins & Farnum, 1962) during their regularly scheduled band rehearsals. Each class period also included instruction and practice in detecting performance errors. Music was collected at the end of each rehearsal to ensure all student participants had the same amount of time to learn the music. The next week, students were recorded while performing each of the excerpts. Following their performance, participants marked the errors on a grading sheet that they remembered making during their live performance. Two weeks after performing, students listened to the audio recording of their own performance and again marked errors on the same grading form.

Results of a two-way ANOVA indicated that participants identified significantly more errors when listening to the audio recording of their performance compared to error detection after their live performance. Results of a *t*-test indicated that students marked significantly fewer errors compared to the experts in both listening conditions. Kepner concluded that immediately following the performance participants were

consumed with the process of performing and were not be able to critically self-assess without the aid of a recording.

Using a sample of seventh- and eighth-grade band students ($N = 29$), Bundy (1987) investigated participants' accuracy of pitch and rhythm detection errors from live and recorded performances. Prior to performing, participants were instructed to pay attention to pitch and rhythm errors in their performance. Following the performance, participants in the live mode marked the pitch and rhythm errors they remembered making on a clean copy of the musical score. The recorded mode occurred two weeks later and utilized pre-recorded error tapes of the same etude to deter participants' recall of their previous performance. During the recorded mode, participants listened to the etude and again marked perceived pitch and rhythm errors.

Results indicated that detection of pitch errors was more accurate in the live mode. Bundy attributed this finding to previous motor learning research, which indicates that kinesthetic senses provide longer lasting information than the aural senses. However, rhythm error detection was slightly more accurate in the recorded mode. With the exception of pitch detection errors in the live mode, participants indicated significantly fewer errors than what actually occurred in both modes. Bundy concluded that additional research is needed to investigate the developing critical listening skills of young student musicians.

Robinson (1993) studied the effectiveness of self-assessment from recall compared to listening to an audio recording of the performance. The day following a concert, collegiate choir students ($N = 45$) evaluated their performance based on their recall of the performance. The evaluation process required each participant to select (a)

their individual best, worst, and favorite performance piece and (b) what he or she considered the best and worst performance piece for the ensemble. During the next choir rehearsal, participants listened to an audio recording of the performance, unaware that they were to evaluate it afterwards. Instead, they were asked to take evaluative notes while listening. After listening to the recordings, participants were given the same evaluation form and asked to list the best, worst, and favorite individual piece. Robinson found no significant differences between singers' evaluative decisions from recall compared to listening to an audio recording.

Another study investigated the effectiveness of assessment from recall compared to listening to an audio recording (Rohwer, 1996). University choir students ($N = 130$) were randomly divided into two groups and 18 hours after their concert, each group evaluated their concert performance using the Cooksey Choral Performance Rating Scale (Cooksey, 1982). One group assessed the performance from recall, while the other group listened to an audio recording. No significant difference was found between the evaluations of the two groups, although the audio recording group was more critical in the areas of dynamics and tempo.

Self-Assessment While Listening to an Audio Recording

Self-assessment served as one of nine independent variables utilized in a model to predict jazz improvisation achievement (Ciorba, 2006). High school instrumentalists enrolled in their school's jazz ensemble ($N = 102$) were audio recorded while performing a jazz improvisation task. Immediately following their performance, students listened to their recording and completed self-evaluations using the Jazz Improvisation Self-Assessment measure, which includes seven performance criteria.

Results of a simultaneous multiple regression analysis indicated that self-assessment was a significant predictor ($p < .005$) of jazz improvisation achievement. Additionally, results of a path analysis indicated that self-assessment had a large direct effect ($\beta = .28$) on jazz improvisation achievement. Ciorba concluded that utilizing a structured form of self-assessment while listening to audio recordings of their musical performances could aid students in the assessment of their improvisational abilities.

Byo and Brooks (1994) studied the performance evaluations of junior high band students compared to experienced music educators according to (a) audio recordings of a university-level band performance and (b) a band performance by the junior high band students representing the sample. Students ($n = 48$) and a group of experienced band teachers/adjudicators ($n = 5$) recorded performance discriminations of both performances using a Continuous Response Digital Interface dial (CRDI). This device allows participants to continually evaluate the performance quality by moving a dial to five different positions that rank the quality as (1) bad playing, (2) not very good playing, (3) just okay playing, (4) good playing, and (5) very good playing. All participants were trained in recording responses on the CRDI dial prior to the main study.

Results indicated that student evaluations of the university band recording and the self-evaluations of the student band recording were substantially higher than the experts' evaluations. Students' self-evaluations correlated poorly ($r = .18$), with the evaluations of the experts, while the evaluations of the university-level performance exhibited a higher correlation ($r = .50$). Byo and Brooks noted that even though the students evaluations were inflated when compared to the experts' evaluations, the

evaluations for both performances frequently mirrored one another when charted on a line graph. This finding indicates that students and experts mostly agreed on the high and low points of the performances. These results suggest that junior high band students are capable of being somewhat objective on the self-evaluations of their performance. Additionally, Byo and Brooks noted that objectivity within the self-evaluations may have resulted from good teaching, where rehearsal and coaching may have helped to make the students aware of performance quality and to acquire critical thinking and listening skills.

The effect of self-recording, self-listening, and self-evaluation on high school instrumentalists within the private lesson studio was studied by Zimmerman (2005). Participants ($N = 93$) who played the flute, clarinet, or saxophone were randomly assigned to either one of two treatment groups or a control group. Over the course of ten private lessons with the researcher, participants in treatment group one ($n = 30$) were asked to record a series of musical performances. After each performance, participants immediately listened to their audio recordings and completed a self-evaluation rubric, which was designed by the researcher. Participants representing treatment group two ($n = 33$) were also recorded during their lessons, but did not listen to the recorded performances until the tenth private lesson. During this listening session, participants did not engage in the process of self-evaluation. Participants representing the control group ($n = 30$) were not recorded nor were they required to evaluate their musical performances.

Results indicated that students within treatment group two were reported to be mostly silent while listening to the portfolio of their recordings, whereas students within

treatment group one commented about specific performance elements that showed improvement while listening to the recording portfolio from their lessons. Participants also completed the Arts Self-Perception Inventory (Vispoel, 1992) as part of a pre- and post-test design. The inventory measured the variables of (a) self-perception, (b) motivation, and (c) music self-perception. The only statistically significant improvement from the pre- to post-tests was found on the self-perception variable for treatment group one, indicating the combination of self-evaluation and immediate self-listening had improved their musical self-esteem. Zimmerman concluded that student-driven evaluations in combination with self-listening are a key element in developing high school aged instrumentalists' musical self-perceptions.

Self-Assessment While Viewing a Video Recording

The following research studies utilized video recordings to guide self-assessment in a variety of music education settings. A multiple case study by Oare (2007) investigated (a) how students utilize goal setting and self-assessment within their private practice time and (b) the effect of self-assessment on student motivation. Two eighth-grade students and four seventh-grade students volunteered to participate in the study. Students either played flute, clarinet, saxophone, or trombone. The study took place over five meetings within a two-month time period. Oare interviewed students before and after three videotaped practice sessions. Immediately following each practice session, the students and the researcher viewed the video, and students were instructed to detail their thought processes within the practice session. Further data was collected from focus group interviews and interviews with the participants' band instructor.

Oare reported that students commonly lacked specificity, which negatively impacted their self-assessment and subsequent practice strategies. To provide specificity within their practice, Oare suggested that students be given clear performance criteria prior to self-assessment, in hopes they will relate their triumphs and failures to personal effort. Additionally, Oare commented that motivation might improve if students have a degree of control over their own assessment.

Bergee (1993) studied the relationships of faculty, peer, and self-evaluations of applied brass performances at the university level. Evaluations were completed using the Brass Performance Rating Scale. This scale consisted of twenty-seven descriptive statements, which were aligned with a Likert-type response scale. At the conclusion of the jury performances, students completed evaluations of their peers and of their own performance while watching the videotape recordings. Faculty and peer evaluations represented the highest correlation, ranging from $r = .86$ to $.91$ ($p < .01$). On the other hand, self-evaluation scores followed no particular pattern and correlations ranged from $r = -.14$ to $r = .78$. Bergee noted that the use of videotape recordings and the faculty's prior knowledge of students did not affect evaluations.

Bergee (1997) continued his research by comparing faculty, peer, and self-evaluations of university voice, percussion, woodwind, brass, and string performance juries. Voice, brass, woodwind, and string instrumentalists were assessed on the following performance criteria: (a) tone, (b) intonation, (c) technique, (d) interpretation, and (e) musical effect. Voice evaluations also assessed diction. Brass and woodwinds were additionally assessed on articulation, and percussionists were also assessed on (a) tone, (b) mallet/sticking technique, (c) body and hand position, (d) interpretation, and

(e) musical effect. Participants were instructed to assess the above performance categories on a scale from 0 (worst conceivable) to 100 (best conceivable). Videotape recordings were utilized to complete peer and self-evaluations. Results indicated that faculty and peer evaluations correlated highly, ranging from $r = .61$ to $r = .98$, while self-evaluations correlated related poorly among faculty and peer evaluations.

Furman (1987) studied the effects of four feedback conditions on the development of guitar accompaniment skills. Participants ($N = 74$) were enrolled in a beginning university guitar course and were separated into four groups based on the following types of feedback: (a) checklist, which served as a form of self-assessment; (b) videotape replay; (c) checklist plus videotape; and (d) traditional instructor feedback. An analysis of the pre- and post-test scores indicated that the two groups utilizing the checklist scored significantly higher on a behavior checklist and song leading scores as compared to the other two groups. Furman also asked participants to complete an attitude questionnaire, with highest scores coming from students in the checklist only group. The checklist only group also mentioned more specific behaviors for improvement. Furman concluded that the use of a behavior checklist for self-evaluation is as effective as the checklist used with a videotape when improving guitar accompanying skills of undergraduate students.

The following music self-assessment research utilized videotape recordings to assess teaching effectiveness. Alley (1980) instructed music therapy majors ($N = 22$) to self-assess their teaching techniques after watching four videotape recordings of their interactions with clients. Self-assessments were completed using observation forms that were based on the following criteria: (a) specificity, (b) lack of excess verbiage, (c)

appropriate to client level, (d) opportunity to follow, (e) statement, (f) voice quality, and (g) organization. Results indicated participants' positive teaching behaviors increased over the course of the study. Furthermore, the most significant increase in teacher effectiveness occurred after viewing the first tape. Alley concluded that student self-assessment, when guided by specific criteria, seemed to increase the desired teaching skills of undergraduate music therapy majors.

Cassidy (1993) compared the self-observations with instructor observations of teacher intensity behavior among a sample of undergraduate students ($N = 10$) enrolled in an elementary music methods course. Participants were videotaped teaching four music lessons to elementary instrumentalists. At the conclusion of each lesson, participants viewed their videotape and self-assessed their teaching by completing a delivery form. This form evaluated the student teachers' effectiveness in delivering the academic information, along with the appropriateness of noise, motor, and passive behavior. In addition, an instruction form was completed, which assessed the amount of information the student teachers gave their pupils while completing a desired task.

The students' self-assessments correlated highly with the instructor's assessment on the delivery form ($r = .90$). Additionally, as the teaching behaviors of the students improved, the self-evaluations and instructor-evaluations reflected this change. Cassidy credited the concrete categories on the delivery form for the high correlation exhibited between student and teacher scores. Overall, students assessed their teaching behavior more favorably than their instructor.

Colwell, (1995) studied the effect of self-evaluation on teacher intensity behaviors. Participants ($N = 44$) were enrolled in an undergraduate elementary music

methods course and were divided into four treatment groups. Two of the treatment groups studied the effects of teaching peers versus children. The other two treatment groups studied the following types of self-evaluation tools utilized by the participants: (1) Continuous Response Digital Interface (CRDI) dial or (2) specific behavioral checklist. Students completed all evaluations while watching videotape recordings of their teaching. A one-way analysis of variance (ANOVA) of the pre- to post-test scores revealed no significant difference among the scores representing the four treatment groups by teaching setting or self-evaluation. However, a significant difference was found from the pre- to post-test scores, indicating that all treatment groups improved over the course of the semester. Similar to Cassidy's finding, Colwell found that participants' evaluated themselves higher than the experts.

Benson (1989) found that videotaped observations guided by self-assessment helped to change the teaching behaviors of violin instructors ($N = 3$). Throughout the study, participants (a) observed the lessons of experienced teachers, (b) studied research on effective teaching, and (c) self-assessed their two videotaped lessons. Lessons were evaluated by the participants and an expert on the following criteria: (a) teacher presentation of a task, (b) student response, and (c) teacher reinforcements. Results indicated that by the second lesson, more time was spent on presenting musical tasks. There was also an improvement in specific reinforcements. Benson advocated the effectiveness of self-observation and self-assessment from a videotape recording when improving teaching behaviors.

Another study investigated the relationship of self-assessment from videotapes to the achievement of basic conducting skills (Yarbrough, 1987). Undergraduate

students ($N = 85$) enrolled in a beginning-conducting course participated in six videotaped conducting sessions. After each session, students observed a video of their conducting and completed a conducting observation form developed by Madsen and Yarbrough (1985). Results indicated students gave themselves 80% more correct marks than incorrect marks. However, students were more apt to give themselves disapproving self-critiques. In addition, statistically significant correlations ($r = .40, p < .01$) were found between students' correct responses and correct marks on the self-observations. Yarbrough concluded that self-observations contributed significantly to an increase in conducting achievement due to the feedback, which closely followed each task. Furthermore, observations from the videotapes allowed participants to thoroughly study their conducting behaviors.

Napoles and Bowers (2010) studied the effects of instructor feedback versus students' self-analysis of their teaching videos when increasing specific teaching reinforcements. Junior and senior music education majors ($N = 26$) enrolled in choral techniques classes from two large universities participated in the pre- and post-test design. Students in the instructor feedback group received instructor-completed scripts, while the self-analysis group completed the scripts while watching videotapes of their teaching. Both groups received training in completing detailed scripts of sequential patterns displayed during three microteaching sessions.

ANOVA results showed no significant difference between the two groups, indicating that students' self-assessment was as effective as instructor feedback. Additionally, students in the self-analysis group displayed a higher mean score ($M = 1.16$) when integrating specific reinforcements into their teaching compared to students

in the instructor feedback group ($M = .85$). Napoles and Bower concluded that student self-analysis might serve as a possible alternative to instructor feedback when training teachers.

Age as a Predictor of Performance Achievement

Ross, Rolheiser, and Hogaboam-Gray (2002), studied the classroom evaluation processes of second-, fourth-, and sixth-grade students. It was discovered that older participants provided more sophisticated evaluations when compared to the younger students. Older students were found to (a) understand the rubric feedback more deeply, (b) clearly indicate areas that needed improvement, (c) construct productive action plans for future learning, and (d) interpret low scores as an indication to increase effort in the future. Furthermore, younger participants were more likely to seek out parental help in understanding their performance, while older students were more likely to compare evaluation scores with their peers.

Hewitt (2005, 2010) also discovered self-assessment differences according to participants' age. In 2005, Hewitt asked middle school and high school band students to self-evaluate their musical performance using the following criteria: (a) tone, (b) intonation, (c) melody, (d) rhythm, (e) tempo, (f) interpretation, and (g) technique/articulation. High school participants were found to provide more accurate self-evaluations for every performance subarea except melody and rhythm. The greatest assessment exaggerations were found among middle school participants. Hewitt concluded high school students were more critical when assessing their performances.

In 2010, Hewitt studied the impact of self-evaluation training on fifth- through eighth-grade band students' self-assessment accuracy. Results of a MANOVA revealed that the fifth-grade performance scores increased significantly in the following performance subareas: (a) tone, (b) intonation, (c) melody, (d) rhythm, (e) tempo, (f) interpretation, and (g) technique/articulation, while the other grades showed less consistent improvement. Hewitt also discovered that the self-evaluations of the middle school participants were mostly inaccurate when compared to the expert evaluations.

Gender as a Predictor of Performance Achievement

Previous research has revealed that gender may have an impact on performance achievement. Goodrich (1996) studied the effect of self-assessment on students' recall and understanding, as well as their level of metacognition during a common science task. Seventh-grade students ($N = 47$) were asked to think out loud and explain their thought processes as they created an arthropod classification system. The treatment group consisted of nine boys and eleven girls who were asked to self-assess their thinking and ongoing work using a criteria-specific rubric designed to assess the science task. The control group, which consisted of eight boys and twelve girls did not utilize the rubric, and thus were not asked to self-assess. The rubric listed process and product characteristics to guide students in their quality and standards while creating the classification system.

Results revealed numerous findings. Girls within the treatment group displayed higher metacognitive thinking skills than girls in the control group, while no significant difference in metacognitive thinking were found for boys in either group. Furthermore, self-assessments based on the criteria-specific rubric positively impacted girls'

metacognitive thought processes, but had a negative affect for the boys. Goodrich suggested that the increase in metacognitive thinking for the girls within the self-assessment group might have been attributed to effort, which increased their self-regulation. Boys were less self-regulating and attributed their scores to ability. This difference in attribution between boys and girls in response to feedback is consistent with previous gender research findings (Dweck & Bush, 1976; Dweck, Davidson, Nelson, & Enna, 1978).

Andrade and Boulay (2003) explored the effectiveness of self-assessment on the writing performance of seventh- and eighth-grade students. Participants ($N = 397$) were randomly divided into a treatment group or a control group. All students were asked to write both a historical essay and a literature essay, with the aid of an instructional rubric that detailed writing criteria. The treatment group also participated in two self-assessment lessons, where they evaluated their essay drafts. In addition, a group of experts assessed all the essays. Results indicated that the scores derived from the treatment group had a significant and positive effect on the historical essay scores of the girls ($p < .0395$), but no significant effect for the boys. To explain the gender difference, the researchers referenced previous studies (Deci & Ryan, 1980; Dweck & Bush, 1976; Dweck et al., 1978; Hollander & Marica, 1970), which found girls to be more extrinsically motivated than boys.

Ross, Rolheiser, and Hogaboam-Gray (2002), utilized rubrics for the purpose of self-evaluation of classroom work among a sample of second-, fourth-, and sixth-grade students. Results indicated that second-grade girls were more certain than boys when understanding evaluation data. Additionally, it was found that second-grade girls were

twice as likely as second-grade boys to compare their current evaluations to previous evaluations. Among fourth-grade students, girls compared their evaluation results with peers more often than boys. When examining all participants, it was discovered that girls demonstrated fuller interpretations of their evaluations than boys, and shared more precise plans for utilizing the evaluations within upcoming work. Girls were also more likely to report that rubrics benefited their evaluation process, while male students generally believed self-evaluation did not benefit their school progress.

Years of Study as a Predictor of Performance Achievement

Camilli (2010) sought to discover which variables best-predicted piano students' length of piano study. Participants ($N = 108$) were private piano students within grades 2-12 who had taken piano lessons for at least two years. All of the student participants completed five questionnaires and their parents completed one questionnaire to gather the participants' opinions on the following independent variables: (a) parental behavioral support, (b) parental cognitive support, (c) parental personal support, (d) parenting style, and (e) students' personality traits.

Results of correlation and regression analyses displayed several statistically significant findings. Positive correlations were found between months of piano study and (a) parental behavioral support ($r = .26$) and (b) parental personal support ($r = .27$). Negative correlations were discovered between months of study and (a) parental cognitive support ($r = -.21$) and (b) demanding parental style ($r = -.22$). Results of a multiple regression displayed that the following variables were statistically significant predictors of students' length of piano study: (a) parental behavioral support ($p < .02$),

(b) parental cognitive support ($p < .001$), (c) parental personal support ($p < .02$), and (d) parental demandingness ($p < .02$).

Camilli concluded that as students get older they may view their parents' cognitive support as a hindrance to their independence, while displays of behavioral and personal support might be perceived as more encouraging. Students who are high achievers become more autonomous in their piano work, which increases their motivation to further practice.

Hewitt (2005, 2010) studied self-assessment differences according to students' year in school. Participants ($N = 143$) within the 2005 study were middle and high school instrumentalists who assessed their music performance on seven-performance criterion. Results revealed that high school participants were the most accurate self-assessors on every performance criterion except melody and rhythm, while scores exhibited by middle school students correlated more closely with the experts in the areas of melody and rhythm. All student participants assessed themselves more highly than the experts, with the greatest difference occurring among the middle school students. Hewitt concluded that high school students are more accurate assessors of their musical performances.

In a 2010 study, Hewitt sought to discover if self-evaluation training would impact fifth- through eight-grade instrumentalists ($N = 211$) self-assessment accuracy. Results showed that fifth-grade students performance scores increased in all the performance subareas, while the performance scores of the sixth-, seventh- and eighth-grade students showed less consistent improvement. Self-evaluation training did not have a statistically significant impact on students' performance scores. Overall, the

middle school participants' self-evaluations were mostly inaccurate when compared with the experts. Hewitt concluded that middle school students need more years of study to become effective and accurate assessors of their musical performances.

Rubrics Used to Assess Achievement in Music Education

Previous research in music education has utilized various measures to evaluate music performance achievement such as (a) self-reflection forms, (b) Likert-type response scales, and (c) behavior checklists. However, rubrics provide specific descriptions of various performance elements at multiple achievement levels (e.g., superior, excellent, good, and poor). Additionally, rubrics provide extra benefits as they provide the assessor with (a) precise descriptions at each achievement level on which to make their evaluative judgment, (b) clear evaluation of how well they performed, and (c) detailed indication of areas to improve upon for future performances (Asmus, 1999).

Bergee (1987) developed and validated a rating scale for evaluating the performances of euphonium and tuba students. Participants serving as the performers ($N = 100$) represented a wide range of levels and ages from pre-college public school instrumentalists to collegiate musicians. To determine the descriptive performance factors to be used within this rubric, Bergee studied (a) previous research, (b) essays by accomplished low brass performers, and (c) various euphonium and tuba adjudication sheets. The information was then summarized into 112 statements, which represented the aural aspects of low brass performance. Furthermore, three experts agreed upon the performance statements to be used. These statements were then aligned with a five-point Likert-type scale, which ranged from (1) strongly disagree to (5) strongly agree. Participants were audio-recorded performing music of their choice. Expert judges ($N =$

50) evaluated two performances and were allowed unlimited playbacks of the recorded performance. With a reliability coefficient of .968, it was determined that inter-judge reliability was internally consistent. Results of a factor analysis revealed the following categories for the Euphonium-Tuba Performance Rating Scale: (a) interpretation/musical effect, (b) tone quality/intonation, (c) technique, and (d) rhythm/tempo.

Bergee (1993) continued his work with a rubric-like evaluation tool to study the relationships between faculty, peer, and self-evaluations of university-level brass jury performances. All evaluations were completed using the Brass Performance Rating Scale. Results indicated a high correlation between faculty and peer evaluations ($r = .86 - .91$), but correlations between self-evaluations and evaluations of peers ($r = -.14 - .58$) and faculty ($r = .10 - .78$) related poorly.

In a later study, Bergee (2003) studied the evaluation process of university juries. Faculty from the following departments participated in the jury evaluations: (a) brass ($N = 4$), (b) percussion ($N = 2$), (c) woodwind ($N = 5$), (d) voice ($N = 5$), (e) piano ($N = 3$), and (f) string ($N = 5$). Evaluation measures used at the university level had previously been created for all the instruments except piano. Bergee examined the previous literature on piano performance adjudication (Wapnick, Flowers, Alegant, & Jasinskas 1993) to compile the appropriate piano performance criteria. With the aid of the piano faculty, Bergee grouped the criteria into the three broad categories of (a) interpretation/musical effect, (b) rhythm/tempo, and (c) technique. The criteria-specific rating scale for each instrument contained subscale items with positive wording to describe distinct performance areas. These criteria were also paired with the following

Likert-type response scale: (a) strongly disagree, (b) disagree, (c) neutral, (d) agree, and (e) strongly agree. An additional form allowed faculty evaluators to award a grade and to write summative comments of each jury performance.

Results indicated moderate to high inter-judge reliability for all participating departments with coefficients ranging from .70 to .80. A number of the faculty evaluators commented that the forms caused them to think about certain performance aspects they might not have considered when providing the traditional written jury comments. Bergee concluded that the criteria-specific rating scales, when combined with detailed descriptors, directed evaluators' comprehensive attention to all performance aspects to provide balanced and helpful feedback to the performers.

Latimer, Bergee, and Cohen (2010) examined the reliability and pedagogical value of a multidimensional performance rubric for state high school orchestra, band, and choir festivals. A team of 14 experts created the rubric, which included point-weighted performance criteria with five levels of detailed descriptors. The performance criteria included (a) tone, (b) intonation, (c) expression, (d) technique/diction, (e) rhythm, (f) note accuracy, (g) balance, and (h) blend. The final rubric was utilized for performances ($N = 2,016$) at the Kansas State Music Festival days. Cronbach's alpha indicated that the interjudge reliability (.88) was internally consistent. Analysis of the questionnaire completed by adjudicators indicated that 94% believed that the rubric was a beneficial assessment tool. Judges recognized the pedagogical value of the rubric, as it provided them with specific information across various performance criteria, which could be considered for their subsequent classroom instruction.

Ciorba and Smith (2009) explored the effectiveness of a multi-dimensional assessment rubric when evaluating undergraduate instrumental and vocal performance juries. The final rubric included five levels of detailed descriptors, which were aligned with the following criteria: (a) musical elements, (b) command of instrument, and (c) presentation. The rubric was utilized for participants' ($N = 359$) spring 2006 performance juries. Thirty-seven judges (a) utilized the rubric for each jury performance, (b) provided written feedback, and (c) assigned a grade for each student within their specific performance area. Overall, inter-judge reliability for the jury panels ranged from moderate to high (.66 - .99). Results of a MANOVA indicated significant differences in rubric scores according to participants' year in college. Ciorba and Smith concluded that a multidimensional performance rubric could effectively measure students' musical achievement.

Saunders and Holahan (1997) explored the appropriateness of a criteria-specific rating scale in selecting members to a high school All-State band. Participants ($N = 926$) were assessed using the Woodwind/Brass Solo Evaluation Form developed by the researchers. Thirty-six judges were trained to use the rating scale by watching a video, followed by a question-and-answer session. The Woodwind/Brass Solo Evaluation Form included four additive rating scales and eleven continuous rating scales. The performance criteria included (a) tone, (b) intonation, (c) technique/articulation, (d) melodic accuracy, (e) rhythmic accuracy, (f) tempo, and (g) interpretation.

Results of a reliability analysis indicated the judges' scores were internally consistent (.92). Saunders and Holahan concluded that the Woodwind/Brass Solo Evaluation Form was effective in detecting differing levels of student performance

achievement. Additionally, it provided participants with a detailed assessment of their performance level using specific criteria, which would be beneficial in determining performance areas that needed further improvement.

The Woodwind/Brass Solo Evaluation Form (Saunders & Holahan, 1997) was also utilized by Hewitt (2001, 2002, 2005, 2010) to study self-assessment within multiple studies. Results from the 2001 study revealed that seventh-, through ninth-grade band students who listened to a performance model and completed self-assessment immediately following their live performance improved on their total performance and the specific performance elements of (a) tone, (b) melodic accuracy, (c) rhythmic accuracy, and (d) interpretation.

Hewitt's 2002 study found a moderate relationship between junior high band students who listened to a performance model compared to experts for the performance subarea of tempo. The self-assessment accuracy of middle school students compared to high school band students was the focus of Hewitt's 2005 study. The high school students displayed greater self-assessment accuracy on the performance subareas of (a) tone, (b) intonation, (c) tempo, (d) interpretation, and (e) technique/articulation. Middle school participants were more accurate on their self-assessments of melody and rhythm. The highest correlation between participants and experts was found on the evaluation of melody, while the lowest correlation was found on the evaluation of technique/articulation.

Hewitt's 2010 study assigned fifth- through eighth-grade band students to the following treatment groups: (a) self-evaluation with instruction, (b) self-evaluation only, and (c) no self-evaluation. The performance scores of fifth-grade students within

the self-evaluation treatment groups showed the most improvement compared to the older participants.

Zimmerman (2005) developed a self-evaluation rubric for high school instrumentalists within the private lesson studio. The rubric used the following criteria for assessment: (a) tone quality, (b) pitch accuracy, (c) rhythmic accuracy, (d) expressive quality, and (e) articulation. Additionally, the rubric included a written self-evaluation section where participants chose one performance element that needed improvement. Participants were asked to describe (a) possible solutions to the problem and (b) practice plans to correct the problem. Zimmerman reported that students became more descriptive and task specific as the study progressed. Results indicated that students who immediately listened to their performances and self-evaluated improved their musical self-esteem as measured on the Arts Self-Perception Inventory (Vispoel, 1992).

Norris and Borst (2007) investigated the reliability of a traditional choral adjudication form compared to a descriptive choral rubric for use at choir festivals. Both measures contained the following performance criteria: (a), tone, (b) diction, (c) blend, (d) intonation, (e) rhythm, (f) balance, and (g) interpretation. For the traditional choir form, criteria were aligned with a five-point rating scale. The rubric included detailed descriptors for each level of the chosen criteria. Four highly esteemed choral music educators adjudicated two performances by the same choirs using the traditional form and the descriptive rubric.

Results indicated that the judges' intra-class correlations, as reflected by rubric criteria, were higher when compared to the traditional form. The only exception

occurred within the rhythm criterion. The traditional form also yielded poor inter-judge reliability on the rhythm criterion, indicating that neither form gave clear results on the choirs' rhythmic achievement. Norris and Borst concluded that the detailed rubric provided a clear distinction among achievement levels for each performance element, resulting in stricter ratings from the judges. They urged music educators to consider developing similar rubric-like performance evaluation tools.

Wapnick, Flowers, Alegant, and Jasinskas (1993) investigated whether evaluative judgment reliability can be increased by utilizing rating scales while examining the musical score and listening to the musical performance. Undergraduate piano majors, graduate piano majors, and piano faculty ($N = 80$) listened to seven different taped interpretations of Liszt's *Totentanz* and were asked to indicate their preferences under the following treatment conditions: (a) examining the musical score, (b) assessing the performance on the rating scale, and (c) watching the musical score and utilizing the rating scale. A seven-point scale ranging from (1) worse than good to (7) superb was aligned with the following criteria: (a) note accuracy, (b) rhythmic control, (c) tempo, (d) phrasing, (e) dynamics, (f) tone quality, (g) interpretation, and (h) overall interpretation. No significant results were found for any of the treatment conditions. Participants were found to be more consistent in their assessment when they did not watch the musical score. Although the results have little bearing on the current study, it is important to note that the current study will use piano performance criteria utilized in the Wapnick et al. study.

Rubrics Used to Assess Achievement in General Education

Rubrics are also commonly utilized within general education to define performance criteria and to guide and enhance student learning and achievement. Bobbette (1999) studied assessment changes that guided the development of pre-service teachers' portfolios over a five-year period. Teaching portfolios are valuable, as they showcase teaching applicants' previous record of learning and display their reflection on that work. The first assessment tools, which were distributed to guide portfolio creation, included a chart followed by a checklist. Bobbette explained that the checklist worked well in a quantitative sense by informing students what items needed to be included, but it neglected to define the quality of work that was expected. A rubric was then created, which clearly defined the standards, requirements, and detailed descriptors of the quality of work for the following criteria: (a) presentation, (b) résumé, (c) educational philosophy, (d) lesson plans, (e) reflective commentary, (f) formal evaluations, and (g) additional items. It was concluded that students who desired to be teachers would have an equal opportunity to create a highly developed teaching portfolio with the aid of the rubric.

Ross, Rolheiser, and Hogaboam-Gray (1999) studied the effect of self-evaluation training on rubrics among a sample of fourth-, fifth-, and sixth-grade students in the writing classroom. Students self-evaluated their narrative stories using the following criteria: (a) plot, (b) characters, (c) setting, (d) interest for the reader, and (e) grammar and spelling. Students within the treatment group were trained in utilizing the rubric for self-assessment over twelve writing sessions, while participants within the control group were not trained to use proper self-assessment practices. Results

indicated that the students within the treatment were more accurate assessors of their stories and were reported to write higher quality narrative stories.

Ross, et al. (2002) continued their self-assessment research to guide general classroom work. With the help of their teachers, a sample of second-, fourth-, and sixth-grade students developed a rubric to self-assess classroom work. Participants reported that the feedback from the evaluations helped them to determine which areas they excelled and which areas needed improvement. Students believed they would do better on their future work because the rubric highlighted areas that needed attention, which helped them to plan future goals. Participants reported the detailed descriptors were very important when evaluating their work.

Andrade and Boulay (2003) investigated the impact of a rubric to guide the composition of historical and literature essays written by seventh- and eighth-grade students. Students within the treatment group were guided in their self-assessment using the rubric over two lessons. Results revealed that the rubric training sessions had a significant and positive effect on the writing process among the female students, but not so for the male students.

Summary of Related Research

Self-Assessment

Previous self-assessment research has revealed a variety of findings. The majority of the research found self-assessment to be most effective when conducted immediately following a specific task (Alley, 1980; Benson, 1989; Bergee, 1993, 1997; Bundy, 1987; Cassidy, 1993; Ciorba, 2006; Colwell, 1995; Furman, 1987; Goodrich, 1996; Hewitt, 2001, 2002, 2005, 2010; Kepner, 1986; Morrison et al., 2004; Napoles,

2008; Oare, 2007; Ross et al, 1999; Sparks, 1990; Yarbrough, 1987; Zimmerman, 2005). Participants in two studies (Robinson, 1993; Rohwer, 1996) did not complete self-assessment immediately following the performance and subsequently did not find self-assessment to be an effective learning tool.

Self-assessment was found to be successful when participants were trained in using the evaluation tool (Andrade & Boulay, 2003; Byo & Brooks, 1994; Hewitt, 2001, 2002, 2005; Kepner, 1986; Napoles & Bower, 2010; Ross, et al., 1999, 2002a, 2002b). Previous research revealed that (a) participants' attitudes increased through the process of self-assessment (Davis, 1981; Furman, 1987; Sparks, 1990), (b) motivation and music self-esteem improved (Aitchison, 1995), and (c) the combination of self-listening and self-evaluation increased musical self-esteem (Zimmerman, 2005).

Several studies successfully utilized self-assessment from an audio or video recording to more accurately detect performance errors, evaluate performance achievement, and make effective teaching behavior changes (Alley, 1980; Benson, 1989; Bergee, 1993, 1997; Bundy, 1987; Cassidy, 1993; Ciorba, 2006; Colwell, 1995; Furman, 1987; Kepner, 1986; Napoles & Bower, 2010; Oare, 2007; Robinson, 1993; Rohwer, 1996; Yarbrough, 1987). A significant finding revealed that self-assessment improved performance achievement (Hewitt, 2001; Ross et al., 1999; Sparks, 1990). Similarly, Ciorba (2006) found self-assessment to have a large direct effect on jazz improvisation achievement.

Age

Previous research has also revealed that students' age might impact performance achievement. Students who self-evaluated their classroom work using rubrics (a)

became more sophisticated in their evaluations, (b) understood the performance rubric more thoroughly, (c) stated areas that needed improvement with greater clarity, and (d) constructed future learning strategies as they grew older (Ross et al., 2002). Students often assessed themselves higher than experts, as found in studies with middle school and high school band students (Bundy, 1987; Byo & Brooks, 1994; Hewitt, 2005, 2010; Kepner, 1986; Morrison et al., 2004), and undergraduate students within a music methods course (Colwell, 1995).

Gender

Gender has also been found to have an impact on performance achievement. The application of a science rubric increased seventh-grade girls' metacognitive thinking skills (Goodrich, 1996). Similarly, the application of a writing rubric for the purpose of self-assessment increased performance scores of girls when writing essays (Andrade & Boulay, 2003). Second-, fourth-, and sixth-grade girls were determined to understand rubric evaluation data more deeply than their male counterparts, and were twice as likely as males to report rubrics benefitting their evaluation processes (Ross et al., 2002).

Overall, young girls attributed their evaluation scores to effort and became more self-regulating while young boys attributed evaluation feedback to ability and decreased self-regulation (Goodrich, 1996; Andrade & Boulay, 2003). While self-assessment has been found to be valuable in general and music education, research in the area of self-assessment of young pianists remains sparse.

Years of Study

Previous research in the area of music education studies has addressed participants' years of musical study in relation to performance achievement. According to Camilli (2010), students may view their parents' cognitive support as a hindrance to their music independence as they get older, while the behavioral and personal support exhibited by parents might be perceived as more encouraging. Hewitt (2005) found that high school band students were more accurate self-assessors than middle school students. In a 2010 study, Hewitt discovered that fifth-grade instrumentalists showed the greatest increase in performance scores compared to other middle school students. Hewitt concluded that younger students need more years of study and an increase in age to become more accurate self-assessors of their musical performances.

Rubrics

Numerous studies have utilized rubrics to measure performance achievement. Music performance rubrics have proven to be a valuable pedagogical tool that provides detailed performance criteria for individual achievement levels to guide future learning (Bergee, 1987, 1993, 2003; Ciorba, 2006; Ciorba & Smith, 2009; Hewitt, 2001, 2002, 2005, 2010; Latimer et al., 2010; Norris & Borst, 2007; Saunders & Holahan, 1997; Zimmerman, 2005).

Rubrics have also been successfully utilized within general education to define and increase the quality of work expected by providing detailed descriptions of the standards, and achievements for teaching portfolios (Bobbette, 1999), narrative stories (Ross et al., 1999), general classroom work (Ross et al., 2002), and historical essays (Andrade & Boulay, 2003). However, no research exists that involves the development

of a piano performance rubric to guide self-assessment of young pianists to measure music performance achievement.

Chapter 3

Method

Previous literature has contributed significantly to the area of performance achievement. However, very little research has been conducted to study how the variables of self-assessment, age, gender, and years of study predict piano performance achievement among young piano students ranging from ages 8-13. The following chapter presents the necessary measurement tools and procedures used to carry out this study.

Pilot Study

Pilot Study Rubric Design

Several studies were reviewed (see Figure 1) to determine the appropriate criteria for the Bronson Piano Performance Achievement Rubric (BPPAR).

Previous study	Articulation	Balance	Dynamics	Intonation	Musical Style/Expression	Posture/Position	Notes/Pitches	Technique	Rhythm/Tempo	Tone Quality
Aitchison, 1995	X			X	X	X		X	X	X
Bergee, 1987, 1993, 1997	X		X	X	X			X	X	X
Bergee, 2003					X			X	X	
Bundy, 1987							X		X	
Burrack, 2002	X				X		X		X	X
Ciorba, 2006					X			X	X	
Cooksey, 1977, 1982	X	X	X	X	X				X	X
Davis, 1981	X		X				X		X	X
Hewitt, 2001, 2002, 2005, 2010	X			X	X		X	X	X	X
Kepner, 1986	X		X	X			X		X	
Latimer et al., 2010		X		X	X		X	X	X	X
Morrison et al., 2004	X	X	X	X			X		X	
Norris & Borst, 2007		X		X	X				X	X
Oare, 2011	X		X		X	X	X		X	X
Rohwer, 1996	X	X	X	X	X				X	X
Saunders & Holahan, 1997	X			X	X		X	X	X	X
Sparks, 1990						X	X	X	X	X
Wapnick et al., 1993			X		X		X		X	X
Zimmerman, 2005	X				X		X			X
Total Used:	12	5	8	10	14	3	12	8	18	14

Figure 1. Performance Criteria Utilized in Previous Studies

Various adjudication forms used for piano competitions and festivals within the Oklahoma Music Teachers Association were also reviewed while selecting appropriate rubric criteria. Once the author created the initial rubric, a group of university piano faculty ($n = 6$) and private studio teachers ($n = 7$) reviewed the BPPAR for content and made suggestions for improvement. The final criteria were (a) notes, (b) rhythm and

timing, (c) articulation, (d) dynamics, and (e) style and mood. A review of literature indicates these five criteria have been used in at least eight previous studies. While the criteria of intonation, tone quality, and technique were also frequently used with previous measurement tools, they were excluded as criteria for the BPPAR for the following reasons: (a) intonation and tone quality are more specific to measurement tools utilized within band and orchestra studies and (b) the author believed technique is too complex for the purpose of self-assessment among a sample of eight to thirteen year-olds.

Detailed descriptors were then applied to each of the following achievement levels for all criteria: (1) needs improvement, (2) okay, (3) good, (4) excellent, and (5) outstanding. Age-appropriate language was used, which could be understood by a sample of young children ranging in age from eight to thirteen. The BPPAR is a detailed rubric, and it served as the (a) self-assessment measure for young pianists representing the sample (i.e., independent variable) and (b) assessment tool used by the expert judges when assessing the piano achievement of students (i.e., dependent variable).

Pilot Study Procedures

Participants ($N = 41$) for the pilot study were young pianists, ranging in age from eight to thirteen. During the spring of 2015, the sample was taken from the private piano studios of (a) the researcher ($n = 4$) and (b) a prominent piano instructor ($n = 37$), who was located in central Iowa. The assisting professional piano instructor (a) studied music education and earned a Liberal Studies degree with a minor in music, (b) holds leadership positions within the state of Iowa and central Iowa levels of the Music

Teachers National Association (MTNA) professional organization, and (c) has successfully taught private piano lessons for over 40 years. The researcher served as the Principal Investigator (PI) and the assisting piano teacher served as the Key Study Personnel (KSP).

The University of Oklahoma Institutional Review Board (IRB) required the Key Study Personnel to complete the Collaborative Institutional Training Initiative (CITI), which provides web-based human research training for academic institutions, government agencies, and commercial businesses. The training consists of eighteen modules. Each module contains readings and quizzes, which address the historical background and current ethical issues pertaining to research with human subjects.

Once CITI training was completed, the PI served as the recruiter and sent out IRB approved e-mails to students within the PI's piano studio (see Appendix D) and the KSP's piano studio (see Appendix E). Attached to the recruitment e-mail were the (a) BPPAR (see Appendix B), (b) student assent form (See Appendix F), and (c) parental consent form (see Appendix G). In addition, the e-mail included a link to an online Qualtrics questionnaire (see Appendix H) where students and their parents could complete the combined assent and consent form. Once the assent/consent forms were completed, the PI and KSP assisted student participants in choosing an appropriate piano piece to perform for the pilot study. The piece was one in which the students were quite familiar and had learned to a high level of achievement. Performance from memory was not required for this study. On the day of data collection, the PI and KSP explained the rubric to the student participants and answered any of their questions. All

participants performed their piano piece and were video recorded using the QuickTime Player, version 10.3, on a MacBook Pro, version 10.9.5.

Participants were divided into a recall group ($n = 21$) and a video group ($n = 20$). Participants representing the recall group assessed their piano performance from recall immediately following their piano performance. Participants representing the video group completed the self-assessment procedure while watching the video recording of their piano performance immediately following their performance. Students within the video group were told they could watch their recording up to two times. All of the students were video recorded, which allowed the researcher to watch and assess each performance at a later time.

The following independent variables were established for both groups: (a) self-assessment (recall group or video group), (b) age, (c) gender, and (d) years of piano study. The recall group consisted of nine males and twelve females, and the video group had nine males and eleven females. The following ages represented the recall group's sample: (a) four 8-year olds, (b) two 9-year olds, (c) three 10-year olds, (d) four 11-year olds, (e) three 12-year olds, and (f) five 13-year olds. The following age groups represented the video group: (a) five 8-year olds, (b) three 9-year olds, (c) three 10-year olds, (d) three 11-year olds, (e) two 12-year olds, and (f) four 13-year olds. The average length of study for the recall group was 3.41 years, and the video group studied piano for an average of 3.52 years. Following data collection, the PI served as the expert judge and assessed all the video recorded performances using the expert BPPAR (see Appendix C). The expert score served as the dependent variable of piano performance achievement.

The role of the PI and KSP as both teacher and researcher was initially met with some concern by the IRB, as they viewed it as a potential conflict of interest. The researcher responded to the IRB concerns by stating that previous research has indicated it is optimal for self-assessment to occur as part of a normal teaching and learning process. Given the young age range of the participants, it was imperative that the piano students felt comfortable during data collection. It was further explained that private piano teachers and their students have an established bond and level of trust, which makes it conducive for the piano instructor to collect data within the normal piano lesson environment. Several studies were submitted to IRB as examples of previous successful self-assessment research where the PI and/or KSP collected data from their own younger students (Aitchison, 1995; Brookhart et al., 2004; Hewitt, 2001, 2002, 2005, 2010; Kostka, 1997; Morrison et al., 2004; Sparks, 1990; and Zimmerman, 2005). Subsequently, the researcher's pilot study was given IRB approval, and data collection occurred during the spring of 2015.

Pilot Study Results

Descriptive statistics were computed for the student and expert scores, including composite scores and scores derived from each of the five BPPAR criteria representing the (a) recall group, (b) video group, and (c) expert's assessments (see Tables 1 and 2). The findings are in alignment with the results from previous self-assessment research with young children, in that the student participants assessed their performances more highly than the expert. The notes criterion was the only exception, with participants and experts achieving the same mean score within both groups.

Table 1

Descriptive Statistics: Pilot Study Recall Group (Student and Expert BPPAR Scores)

Criterion	<i>M</i> (S)	<i>SD</i> (S)	<i>M</i> (E)	<i>SD</i> (E)
Notes	3.90	0.94	3.90	0.70
Rhythm & Timing	3.62	0.87	3.05	0.81
Articulation	3.33	0.91	2.76	0.70
Dynamics	3.29	1.01	1.67	0.73
Style & Mood	3.81	0.98	2.62	0.67
Total Score	17.81	2.80	14.05	2.20

Note. *n* = 21. S = Student Self-Assessment, E = Expert Assessment.

Table 2

Descriptive Statistics: Pilot Study Video Group (Student and Expert BPPAR Scores)

Criterion	<i>M</i> (S)	<i>SD</i> (S)	<i>M</i> (E)	<i>SD</i> (E)
Notes	3.80	0.83	3.80	0.83
Rhythm & Timing	3.65	0.99	3.30	1.08
Articulation	4.10	1.12	3.40	0.82
Dynamics	3.38	0.90	2.20	0.95
Style & Mood	3.88	1.30	2.90	0.79
Total Score	18.80	3.79	15.60	3.19

Note. *n* = 20. S = Student Self-Assessment, E = Expert Assessment.

Correlation coefficients were computed to compare student and expert scores for the five BPPAR criteria within the recall group and video group (see Tables 3 and 4). It is interesting to note the recall group exhibited no statistically significant correlations between expert and student scores on the same performance criteria. However, two statistically significant correlations were discovered within the video group when comparing student and expert scores of the same performance criterion: (a) notes ($r = .85, p < .01$) and (b) rhythm and timing ($r = .50, p < .05$). When compared with the recall group, student self-assessment scores within the video group correlated more closely with the expert's scores for all the criteria except dynamics. These results suggest that the use of the video recording to aid self-assessment helped students to be more accurate self-assessors, especially when assessing (a) notes and (b) rhythm and timing.

Table 3

Pilot Study Recall Group Intercorrelations Between Student and Expert BPPAR Criteria Scores

Criterion	E Notes	E R&T	E Artic	E Dynm	E S&M	S Notes	S R&T	S Artic	S Dynm	S S&M
E Notes	-	.36	.16	.13	.35	.36	.27	-.10	.32	.41
E R&T		-	-.25	.20	.41	.07	.17	.11	-.02	.39
E Artic			-	.33	.18	-.04	-.16	.13	.17	.08
E Dynm				-	.54*	-.12	-.37	.55**	.41	-.16
E S&M					-	.02	.08	.45*	.32	-.04
S Notes						-	.38	-.14	.45*	.36
S R&T							-	-.02	.30	.26
S Artic								-	.33	-.21
S Dynm									-	.36
S S&M										-

Note. $n = 21$. E = Expert; S = Student; R&T = Rhythm & Timing; Artic = Articulation; Dynm = Dynamics; S&M = Style & Mood. Boldface indicates expert and student correlations of the same performance criteria. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Table 4

Pilot Study Video Group Intercorrelations Between Student and Expert BPPAR Criteria Scores

Criterion	E Notes	E R&T	E Artic	E Dynm	E S&M	S Notes	S R&T	S Artic	S Dynm	S S&M
E Notes	-	.48*	-.03	.19	.53*	.85**	.61**	.19	.18	-.02
E R&T		-	.15	.40	.53*	.54*	.50*	.15	.01	.16
E Artic			-	.36	.39	.05	.44	.18	.25	.35
E Dynm				-	.80**	.25	.36	.08	.15	.24
E S&M					-	.61**	.56*	.13	.20	.25
S Notes						-	.61**	.31	.11	.17
S R&T							-	.51*	.42	.33
S Artic								-	.48*	.66**
S Dynm									-	.52*
S S&M										-

Note. $n = 21$. E = Expert; S = Student; R&T = Rhythm & Timing; Artic = Articulation; Dynm = Dynamics; S&M = Style & Mood. Boldface indicates expert and student correlations of the same performance criteria. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Main Study

Main Study Rubric Design

Following the pilot study, the researcher made several necessary modifications in order to improve the BPPAR (see Appendix L) for the main study. For ease of student and expert assessment, it was decided to reduce the rubric's five achievement levels to four. The fifth achievement level (i.e. outstanding) was eliminated. The achievement levels for the main study rubric were updated to range from (1) needs improvement, (2) okay, (3) good, and (4) excellent. Additionally, the achievement description of "almost always" was eliminated from the detailed descriptors for each criterion.

Within the criterion of rhythm and timing, the BPPAR for the pilot study included the following descriptors (a) correct rhythms and rests, (b) steady beat, and (c) correct use of expressive timings: *ritardando* and *accelerando*. While assessing the student performances, the researcher decided the term *tempo* needed to be added to the description. As such, the following rhythm and timing description was added to the main study BPPAR: correct tempo. Another change occurred within the note criterion, which previously listed in the pilot study rubric description: playing the correct notes. An additional description was added to the notes category of the main study BPPAR: all of the notes clearly speak and project.

While over-seeing the student assessment process and examining the students' completed rubrics, it was discovered that numerous students had written specific comments on the rubric to guide their learning. For example, students would notate a specific measure where they played an incorrect note, rhythm, or played too loudly for

the indicated dynamic. There was no designated space on the pilot study BPPAR for students to write these specific comments. Accordingly, the BPPAR for the main study included two lines after each criterion for students to write specific comments to guide their further practice and learning of their piano solo. To facilitate the inclusion of student comments, the following instruction at the top of the rubric was added to the BPPAR to be utilized for the main study: Within the comments section, students will be encouraged to write specific measures that need improvement, along with other helpful comments.

Main Study Procedures

Data collection for the main study was conducted during the 2015-2016 academic year. Participants ($N = 184$) included young pianists, ranging in age from eight to thirteen. Student participants were volunteers from the private piano studios of (a) teachers in Iowa and Oklahoma who were members of the Music Teachers National Association ($n = 180$) and (b) music majors at a university in Iowa ($n = 4$).

The researcher served as the Principal Investigator (PI) and was assisted in the data collection process by seven Key Study Personnel (KSP). The KSP included (a) four private piano teachers in Iowa, (b) two private piano teachers in Oklahoma, and (c) a music education graduate student at a university in Oklahoma. As stipulated by the University of Oklahoma IRB, all KSP completed the CITI human subjects research training.

The researcher distributed IRB approved recruitment e-mails directly to participants and also to private piano teachers who forwarded the e-mail to parents of students within their piano studios (see Appendix N). The recruitment e-mail included

attachments of the (a) BPPAR Student Self-Assessment Form (see Appendix L), (b) IRB Assent Document for Child Participants (see Appendix O), and (c) IRB Consent Document (see Appendix P). Additionally, the e-mail included a link to an online Qualtrics questionnaire (see Appendix Q) where students and their parents could complete the combined assent and consent form.

The researcher created an MP3 audio recording explaining the rubric. This recording was shared with the KSP to play for the participants using iTunes. To insure understanding prior to the student self-assessment process, the PI and KSP asked the participants if they had any questions about the rubric. All of the participants performed a piano solo, which was learned to an achievement level appropriate to perform for a piano festival, audition, or recital. Performance from memory was not required. All participants performed their piano solo and were video recorded using the QuickTime Player (version 10.3) on a MacBook Pro laptop (version 10.9.5).

Participants were divided into a recall group ($n = 92$) and a video group ($n = 92$). The recall and video groups were evenly stratified according to the following independent variables: (a) gender, (b) age, and (c) years of piano study. Participants in the recall group assessed their piano performance from recall immediately following their piano performance. The recall group, which included 34 males and 58 females, had been studying piano for an average length of 3.38 years. The following age groups represented the recall group's sample: (a) 8-year olds ($n = 18$), (b) 9-year olds ($n = 21$), (c) 10-year olds ($n = 14$), (d) 11-year olds ($n = 19$), (e) 12-year olds, ($n = 12$), and (f) 13-year olds ($n = 8$).

The video group completed self-assessment while watching the video recording of their piano performance immediately following their performance. Students within the video group were instructed that they could watch their recording up to two times. The video group, which included 32 males and 60 females, had been studying piano for an average length of 3.46 years. The following age groups represented the video group: (a) 8-year olds ($n = 19$), (b) 9-year olds ($n = 18$), (c) 10-year olds ($n = 16$), (d) 11-year olds ($n = 20$), (e) 12-year olds, ($n = 10$), and (f) 13-year olds ($n = 9$). It was determined that Keith's (2006) "minimum sample size requirement of 10-20 participants per each independent variable" was satisfied (p. 202).

In order to answer the sixth research question, two to three students representing each age category ($n = 16$) from the recall and video groups were video recorded while completing their self-assessment and asked a series of brief questions to determine if students believed the BPPAR was a helpful piano practice tool. This subgroup contained 6 male and 10 female participants. The researcher asked the students the following questions: (1) Which rubric category is the easiest to answer and why? (2) Which rubric category is the most challenging to answer and why? (3) Did anything confuse you on the rubric? (4) Would you add or change anything on the rubric? and (5) Would you use the rubric in your practice time at home? In addition, the students representing the video group ($n = 12$) were asked a sixth question: Did the video recording sound different than what you remembered hearing when you performed?

Following data collection, the PI and two prominent Iowa piano teachers served as the expert judges and (a) watched all video recordings of the participants' piano performances from the recall and video groups and (b) assessed each performance using

the expert BPPAR (see Appendix M). Both of the expert piano teachers (a) earned music education degrees from universities in Iowa (b) have taught private piano for 40-50 years, (c) are Nationally Certified Teachers of Music through the Music Teachers National Association (MTNA), and (d) are actively involved with MTNA, holding leadership positions at the local and state levels. In addition, one of the experts taught piano pedagogy courses at an Iowa university.

Main Study Data Analysis

The judges' assessments for each student, as measured by the BPPAR, served as the dependent variable (i.e., piano performance achievement). The independent variables were (a) self-assessment from recall immediately following a live piano performance (recall group), (b) self-assessment while watching a video recording immediately following a live piano performance (video group), (c) age, (d) gender, and (e) years of piano study. Descriptive statistics were used to answer the first research question. Correlation analyses were used to answer the second and third research questions. To answer the fourth and fifth research questions, simultaneous multiple regression analyses were conducted for the recall and video groups to investigate which of the following independent variables best predict piano performance achievement: (a) self-assessment, (b) age, (c) gender, and (d) years of piano study. In order to answer the sixth research question, a subsample of participants were asked to provide their thoughts and suggestions to determine if the BPPAR was perceived as a helpful piano practice tool. Two to three students per age category were video-recorded and asked a series of brief questions during their self-assessment process.

Main Study Reliability Analyses

Cronbach's alpha was used to calculate the internal reliability of the recall and video groups' BPPAR self-assessment scores (see Table 5). Both the recall and video groups had a reliability coefficient of .75, which indicated the BPPAR measure was internally consistent. Within the recall group, the total interjudge reliability for the BPPAR was .90, while the reliability for the criteria ranged from .75 to .80 (see Table 6). The total interjudge reliability within the video group was .91, with the criteria reliability ranging from .73 to .82. (see Table 7). These results indicate the experts' piano performance achievement scores for the BPPAR criteria were internally consistent.

Table 5

Main Study Internal Reliability of the BPPAR Self-Assessment Criteria Scores

Measure	α
Recall Group Self-Assessment	.75
Video Group Self-Assessment	.75

Note. $N = 184$.

Table 6

Main Study Recall Group Interjudge Reliability

Criterion	α
Notes	.80
Rhythm & Timing	.78
Articulation	.75
Dynamics	.78
Style & Mood	.77
Total	.90

Note. n = 92.

Table 7

Main Study Video Group Interjudge Reliability

Criterion	α
Notes	.82
Rhythm & Timing	.83
Articulation	.73
Dynamics	.79
Style & Mood	.78
Total	.91

Note. n = 92.

Table 8

Main Study Interjudge Reliability (Complete Sample)

Criterion	α
Notes	.81
Rhythm & Timing	.80
Articulation	.73
Dynamics	.78
Style & Mood	.77
Total	.90

Note. $N = 184$

Chapter 4

Results

The purpose of this study was to determine which of the following variables best predict the performance achievement of young piano students ranging from ages 8-13:

(a) self-assessment from recall immediately following a live piano performance (recall group), (b) self-assessment while watching a video recording immediately following a live piano performance (video group), (c) age, (d) gender, and (e) years of piano study.

Data were collected and analyzed based on the following research questions.

Research Questions

1. What are the descriptive statistics of the sample as represented by the Bronson Piano Performance Achievement Rubric (BPPAR)?
2. What are the interrelationships among the following variables: (a) self-assessment from recall immediately following a live piano performance (recall group), (b) age, (c), gender, and (d) years of piano study?
3. What are the interrelationships among the following variables: (a) self-assessment while watching a video recording immediately following a live piano performance (video group), (b) age, (c), gender, and (d) years of piano study?
4. Which of the following variables best predict the performance achievement of young piano students ranging from ages 8-13: (a) self-assessment from recall immediately following a live piano performance (recall group), (b) age, (c), gender, and (d) years of piano study?

5. Which of the following variables best predict the performance achievement of young piano students ranging from ages 8-13: (a) self-assessment while watching a video recording immediately following a live piano performance (video group), (b) age, (c), gender, and (d) years of piano study?
6. What are the participants' thoughts and suggestions on using the BPPAR for the purpose of self-assessment?

Descriptive Analyses

To answer the first research question, descriptive statistics were computed for the student and expert scores representing the five BPPAR criteria and total scores for both the recall group and video group (see Tables 9, 10, 11, and 12). Normal distributions were found for all the variables except articulation and style and mood.

Further analysis revealed several important findings from the scores within the recall and video groups. The mean scores for the students within the recall group ranged from 3.25 (dynamics) to 3.47 (style and mood) (see Table 9). Students within the video group assessed their performances more critically, with mean scores ranging from 3.08 (dynamics) to 3.46 (style and mood) (see Table 11). The mean scores for the experts within the recall group ranged from 2.44 (dynamics) to 3.51 (notes) (see Table 10). The mean scores for the experts within the video group followed the same trend, with scores ranging from 2.43 (dynamics) to 3.46 (notes) (see Table 12). The dynamics criterion represented the lowest mean scores from the (a) recall group, (b) video group, and (c) expert group. Students representing the recall and video groups assessed the criterion of style and mood criterion the highest while the experts rated student performances for this criterion as the second lowest.

Students within the recall group assessed their performance more highly than the experts on all criteria except notes. However, students within the video group (a) were more critical than the experts on the criteria of notes and rhythm and timing and (b) assessed their performances more highly on the criteria of articulation, dynamics, and style and mood. Overall, the assessment scores of students within the recall group were more highly inflated compared to the experts than the students within the video group.

Table 9

*Main Study Recall Group Descriptive Statistics for the Self-Assessment Variable
(Student BPPAR Criteria Scores)*

Criterion	Mean	SD	Skewness	Kurtosis
Notes	3.34	0.56	-0.09	-0.69
Rhythm & Timing	3.33	0.63	-0.39	-0.65
Articulation	3.35	0.76	-1.30	2.72
Dynamics	3.25	0.79	-0.90	0.36
Style & Mood	3.47	0.75	-1.50	2.16
Total Score	16.75	2.16	-0.71	-0.24

Note. $n = 92$.

Table 10

*Main Study Recall Group Descriptive Statistics for the Piano Performance Achievement
Dependent Variable (Expert BPPAR Criteria Scores)*

Criterion	Mean	<i>SD</i>	Skewness	Kurtosis
Notes	3.51	0.48	-0.62	-0.31
Rhythm & Timing	3.24	0.53	-0.68	0.16
Articulation	3.18	0.67	-1.54	4.73
Dynamics	2.44	0.81	-0.16	-0.92
Style & Mood	3.12	0.64	-0.48	-0.61
Total Score	15.48	2.51	-0.52	-0.47

Note. n = 92.

Table 11

*Main Study Video Group Descriptive Statistics for the Self-Assessment Variable
(Student BPPAR Criteria Scores)*

Criterion	Mean	<i>SD</i>	Skewness	Kurtosis
Notes	3.28	0.60	-0.20	-0.55
Rhythm & Timing	3.15	0.69	-0.42	-0.10
Articulation	3.32	0.80	-1.45	3.02
Dynamics	3.08	0.80	-0.40	-0.64
Style & Mood	3.46	0.65	-1.05	1.08
Total Score	16.24	2.38	-0.69	-0.11

Note. n = 92.

Table 12

Main Study Video Group Descriptive Statistics for the Piano Performance Achievement Dependent Variable (Expert BPPAR Criteria Scores)

Criterion	Mean	SD	Skewness	Kurtosis
Notes	3.46	0.53	-0.74	0.08
Rhythm & Timing	3.17	0.61	-0.69	0.36
Articulation	3.25	0.65	-1.02	0.51
Dynamics	2.43	0.82	-0.23	-0.91
Style & Mood	3.09	0.66	-0.74	-0.16
Total Score	15.40	2.61	-0.74	-0.11

Note. $n = 92$.

Correlation Analyses

Correlation analyses were conducted in order to answer the second and third research questions. Pearson product-moment correlations were computed to compare student and expert scores for the five BPPAR criteria within the recall and video groups (see Tables 13 and 14). All of the criteria within the recall and video groups, with the exception of style and mood, exhibited statistically significant correlations with the experts' dependent variable of piano performance achievement, which was defined by the experts' composite score. Within the recall group, correlation coefficients between students and experts ranged from $r = .11$ (style and mood) to $r = .62$ (notes). Similarly, within the video group, the student and expert correlation coefficients ranged from $r = .07$ (style and mood) to $r = .63$ (notes).

Within the recall group, the following variables displayed statistically significant correlations: (a) notes ($r = .62, p < .01$), (b) articulation ($r = .30, p < .01$), (c) dynamics ($r = .29, p < .01$), and (d) rhythm and timing ($r = .25, p < .05$). The following variables

displayed statistically significant correlations within the video group: (a) notes ($r = .63$, $p < .01$), (b) articulation ($r = .42$, $p < .01$), (c) dynamics ($r = .39$, $p < .01$), and rhythm and timing ($r = .31$, $p < .01$). When compared with the recall group, student self-assessment scores within the video group correlated more closely with the experts' scores for all the criteria except style and mood.

Table 13

Main Study Recall Group Intercorrelations Between Student and Expert BPPAR Criteria Scores

Criterion	E Notes	E R&T	E Artic	E Dynm	E S&M	S Notes	S R&T	S Artic	S Dynm	S S&M
E Notes	-	.56**	.30**	.39**	.54**	.62**	.06	.09	.03	.27*
E R&T		-	.36**	.53**	.67**	.33**	.25*	-.08	.10	.19
E Artic			-	.56**	.58**	.12	.26*	.30**	-.00	.58**
E Dynm				-	.81**	.28**	.28**	.13	.29**	.14
E S&M					-	.30**	.21*	.07	.10	.11
S Notes						-	.12	.13	.23*	.50**
S R&T							-	.22*	.32**	.37**
S Artic								-	.24*	.33**
S Dynm									-	.21*
S S&M										-

Note. $n = 92$. E = Expert; S = Student; R&T = Rhythm & Timing; Artic = Articulation; Dynm = Dynamics; S&M = Style & Mood. Boldface indicates expert and student correlations of the same performance criteria. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Table 14

Main Study Video Group Intercorrelations Between Student and Expert BPPAR Criteria Scores

Criterion	E Notes	E R&T	E Artic	E Dynm	E S&M	S Notes	S R&T	S Artic	S Dynm	S S&M
E Notes	-	.51**	.34**	.33**	.49**	.63**	.08	.11	.28**	.10
E R&T		-	.48**	.53**	.65**	.35**	.31**	.22*	.45**	.10
E Artic			-	.56**	.64**	.09	.14	.42**	.28**	.09
E Dynm				-	.78**	.21*	.26*	.16	.39**	.07
E S&M					-	.22*	.20	.13	.29**	.07
S Notes						-	.37**	.15	.28**	.29**
S R&T							-	.15	.32**	.38**
S Artic								-	.37**	.31**
S Dynm									-	.31**
S S&M										-

Note. $n = 92$. E = Expert; S = Student; R&T = Rhythm & Timing; Artic = Articulation; Dynm = Dynamics; S&M = Style & Mood. Boldface indicates expert and student correlations of the same performance criteria. * $p < .05$, two-tailed. ** $p < .01$, two-tailed.

Regression Analyses

In order to answer the fourth and fifth research questions, simultaneous multiple regression analyses were conducted within the recall and video groups to determine which of the following variables were statistically significant predictors of piano performance achievement: (a) self-assessment, (b) age, (c) gender, and (d) years of piano study.

Recall Group

Within the recall group, the four independent variables combined to account for 13% of the variance in piano performance achievement (see Table 15). Accordingly, the overall multiple regression was statistically significant, $R^2 = .131$, $F(4, 87) = 3.27$, $p < .05$. Results further revealed that self-assessment ($p < .001$) was the only statistically significant predictor of piano performance achievement. On average, for each *SD* unit change in self-assessment, piano performance achievement increased by .32 of a *SD* unit, once the other variables were taken into account. Tests for tolerance and variance inflation factor (VIF) were conducted to check for the existence of multicollinearity. Tolerance values ranged from .63 to .97, indicating that all variables were safely independent from each other. The VIF values ranged from 1.02 to 1.59, which fall well below the levels that indicate the existence of multicollinearity.

Table 15

Simultaneous Multiple Regression Analysis: Recall Group

Variable	<i>B</i>	<i>S</i>	β	<i>p</i>	Tolerance	VIF
Age	.67	.56	.14	.27	.63	1.59
Gender	-.38	1.57	-.02	.81	.98	1.02
Years	-.18	.55	-.04	.74	.65	1.53
Self-Asses	1.13	.35	.32	.00	.97	1.03

Note. $n = 92$. $R^2 = .131$, $F(4, 87) = 3.27$, $p < .05$. Years = Years of Piano Study; Self-Asses = Student Self-Assessment.

Video Group

Within the video group, the four independent variables combined to account for 23% of the variance in piano performance achievement (see Table 16). Accordingly, the overall multiple regression was statistically significant, $R^2 = .225$, $F(4, 87) = 6.32$, $p < .001$. Results further revealed that gender ($p < .05$) and self-assessment ($p < .001$) were statistically significant predictors of piano performance achievement. On average, for each *SD* unit change in gender, piano performance achievement increased by .21 of a *SD* unit, once the other variables were taken into account. Furthermore, for each *SD* unit change in self-assessment, piano performance achievement increased by .42 of a *SD* unit, once the other variables were taken into account. Tests for tolerance and VIF were conducted to check for the existence of multicollinearity. Tolerance values ranged from .58 to .98, indicating that all variables were safely independent from each other.

The VIF values ranged from 1.02 to 1.73, which fall well below the levels that indicate the existence of multicollinearity.

Table 16

Simultaneous Multiple Regression Analysis: Video Group

Variable	<i>B</i>	<i>S</i>	β	<i>p</i>	Tolerance	VIF
Age	-.05	.60	-.01	.93	.60	1.67
Gender	3.35	1.59	.21	.04	.95	1.06
Years	-.01	.53	-.00	.10	.58	1.73
Self-Asses	1.39	.31	.42	.00	.98	1.02

Note. $n = 92$. $R^2 = .225$, $F(4, 87) = 6.32$, $p < .001$. Years = Years of Piano Study; Self-Asses = Student Self-Assessment.

Participants' Self-Assessment Feedback

In order to answer the sixth research question, two to three students from each age category ($n = 16$) were video recorded while completing their self-assessment to determine their perception towards the BPPAR as a helpful practice tool. Students within this subgroup were asked the following questions: (1) Which rubric category is the easiest to answer and why? (2) Which rubric category is the most challenging to answer and why? (3) Did anything confuse you on the rubric? (4) Would you add or change anything on the rubric? and (5) Would you use the rubric as part of your practice routine at home? Additionally, the students representing the video group ($n = 12$) were asked a sixth question: Did the video recording sound different than what you

remembered hearing when you performed? A summary of participants' responses is shown in Table 17.

As part of this process, students were asked to provide a reason for their responses. Select student explanations representing the majority of the student responses from this subgroup are included below. For question number one, six (46.2%) students stated the notes criterion was the easiest category to answer on the rubric. When asked to provide a reason, students answered with the following responses: (a) "I can hear myself when I mess up one note" (10 year-old female); and (b) "I missed a lot of the notes. Probably because I hear it when I practice" (10 year-old male). Three (23.1%) students indicated that style and mood was the easiest category to select, providing such reasons as (a) "I can hear when it's happy and when it's sad" (11 year-old female); and (b) "because we [teacher and student] went through and wrote down what part of the tournament [in a piece titled *The Tournament Begins*] it was and what was going on" (10 year-old female). Other responses for the easiest rubric category included (a) dynamics (2 students, 15%), (b) rhythm and timing (1 student, 7.7%), and (c) an 8 year-old boy was unsure.

For question number two, five (26.3%) students indicated that rhythm and timing was the most challenging category to answer on the rubric, providing such reasons as (a) "you don't have a metronome playing" (9 year-old female); and (b) "this song has many types of shaping, so it's very flexible. So, it's sort of hard to figure out what's right or wrong" (12 year-old female). Four (21.1%) students responded that articulation was the hardest to answer; with a 10 year-old female stating "I usually focus more on the notes playing instead of looking at the slurs." Four (21.1%) selected

dynamics as the most challenging category to answer. Student reasons included (a) “I didn’t hear very many softs in the video. It sounded softer when I was playing than what I heard on the video” (8 year-old female); and (b) “I knew sometimes when I played the melody that the left hand might have been a little louder than the right hand” (12 year-old male). Style and mood was stated as the most challenging rubric category to answer by 4 (21.1%) students for the following reasons: (a) “I really didn’t think about how I played it [style and mood]. I hadn’t really thought about it before.” (11 year-old male); and (b) “I guess I forgot about it while I was playing” (13 year-old female). A 9 year-old female responded that the notes criterion was the hardest category to answer “because when you’re hearing it and playing it fast, you can’t like notice them [notes].”

The third question asked students if anything confused them on the rubric. Seven (87.5%) students responded no. One 10 year-old male student stated “yes, dynamics. Some words I didn’t know.” To question number four, 7 (100%) of the students replied they would not add or change anything on the rubric. For question number five, six (100%) of the students replied they would use the rubric when their practicing at home.

The sixth question was designed for students representing the video group, in which they were asked if the video recording sounded different than what they remembered from their performance. Seven (77.8%) of the students answered yes to this question, and the responses included:

- “It did sound different. For example, the bass, it sounded like at the same amplitude, volume, as the melody. I kind of noticed them differently” (11 year-old male).
- “The transitions between each theme seemed a lot longer than I thought it was. Then for the top notes for the octaves, I didn’t know they weren’t sounding enough. I thought they were pretty loud” (13 year-old male).

When asked which category was the most challenging to answer, an 11 year-old female stated “articulation, because sometimes when I have to move my hands and I have the slur and I stop at the bar line.” The researcher further asked if she heard the stops at the bar lines when she performed or only in the video, and the participant responded “only when I listened to the video.” Two (22.2%) students responded by saying the video recording did not sound different than what they recalled hearing when they performed. A 9 year-old female stated, “I heard most of the things while I was playing.”

Table 17

Participants' Self- Assessment Feedback (Questions and Responses)

Question and Response	Frequency	Percentage
1. Which rubric category is the easiest to answer?		
Notes	6	46.2
Style & Mood	3	23.1
Dynamics	2	15.0
Rhythm & Timing	1	7.7
Unsure	1	7.7
2. Which rubric category is the most challenging to answer?		
Rhythm & Timing	5	26.3
Articulation	4	21.1
Dynamics	4	21.1
Style & Mood	4	21.1
Notes	1	5.3
Unsure	1	5.3
3. Did anything confuse you on the rubric?		
No	7	87.5
Yes	1	12.5
4. Would you add or change anything on the rubric?		
No	7	100.0
Yes	0	0.0
5. Would you use the rubric as part of your practice routine at home?		
Yes	6	100.0
No	0	0.0
6. Did the video recording sound different than what you remembered hearing when you performed?		
Yes	7	77.8
No	2	22.2

Note. Recall Group ($n = 4$), Video Group ($n = 12$).

Summary

The young piano students ranging from ages 8-13 who participated in this research study were found to be accurate assessors of their playing. Statistically significant correlations ($p < .01$, $p < .05$) were found within the recall and video groups between student and expert scores on the same performance criterion on all BPPAR criteria, except style and mood. The students were most accurate on their assessment of (a) notes, followed by (b) articulation, (c) dynamics, (d) rhythm and timing, and least accurate on (e) style and mood. The student participants assessed their performances most highly on style and mood, while the experts gave the note category the highest scores. Students representing both the recall and video groups and the experts assessed the criterion of dynamics the lowest. The video recording helped the students to be more accurate assessors of their playing compared to students who self-assessed based on their recall. Compared to the video group, the self-assessment scores of students within the recall group were more highly than the expert assessment scores.

Results of simultaneous multiple regression analyses determined the variables of age, gender, years of piano study, and self-assessment combined to account for (a) 13% of the variance within the recall group, and (b) 23% of the variance within the video group when predicting piano performance achievement. The variable of self-assessment ($p < .001$) was found to be a statistically significant predictor of piano performance achievement within both the recall and video groups. Furthermore, gender ($p < .05$) was found to be a statistically significant predictor of piano performance achievement within the video group.

A summary of the assessment feedback revealed participants believed (a) notes was the easiest criterion to assess, (b) rhythm and timing was the most challenging criterion to assess, (c) the rubric was comprehensive and easy to understand, (d) the rubric would be helpful in their practice time, and (e) the video recording did make it easier to hear how their performance actually sounded.

Chapter 5

Conclusion

Summary

The purpose of this study was to discover which variables best predict the performance achievement of young piano students ranging from ages 8-13. After a thorough review of the literature, it was determined that the following independent variables may be effective predictors of piano performance achievement: (a) self-assessment from recall immediately following a live piano performance (recall group), (b) self-assessment while watching a video recording immediately following a live piano performance (video group), (c) age, (d) gender, and (e) years of piano study. The Bronson Piano Performance Achievement Rubric (BPPAR) was designed by the researcher to measure the independent variable of self-assessment within the recall and video groups. The dependent variable was operationally defined as piano performance achievement, which was derived from the experts' BPPAR assessment scores from watching recordings of the participants' performances.

Participants ($N = 184$) were volunteers from the private piano studios of (a) teachers in Iowa and Oklahoma who were members of the Music Teachers National Association ($n = 180$), and (b) music majors at a university in Iowa ($n = 4$). Participants were divided into a recall group ($n = 92$) and a video group ($n = 92$). Both groups were evenly stratified based on the following independent variables: (a) gender, (b) age, and (c) years of piano study.

The researcher and seven Key Study Personnel (KSP) collected data during the 2015-2016 academic year. To insure adequate understanding of the self-assessment

process, participants (a) listened to an audio recording explaining the rubric and (b) were asked if they had any questions prior to participation. All of the participants were video recorded while performing one piano solo. The piano solos matched achievement levels that were appropriate to perform for a piano festival, audition, or recital. Participants in the recall group assessed their piano performance from memory immediately following their piano performance. Participants in the video group completed the self-assessment procedure while watching their video recording immediately following the performance. To measure the dependent variable of piano performance achievement, a panel of three judges watched all of the video recordings of the participants' piano performances and assessed each performance using the expert BPPAR. In order to answer the sixth research question, two to three students from each age category ($n = 16$) were (a) video recorded while completing their self-assessment and (b) asked a series of brief questions to determine if students believed the BPPAR was a helpful piano practice tool.

Cronbach's alpha was used to determine the internal consistency of the BPPAR measure for (a) the independent variable of self-assessment (student scores) and (b) the dependent variable of piano performance achievement (expert scores). Results indicated the responses from the BPPAR measure were internally consistent. Descriptive statistics were calculated for the dependent and independent variables, followed by correlation analyses. Simultaneous multiple regression analyses indicated (a) the variable of self-assessment ($p < .001$) was found to be a statistically significant predictor of piano performance achievement within both the recall and video groups,

and (b) gender ($p < .05$) was found to be a statistically significant predictor of piano performance achievement within the video group.

Conclusions

Descriptive Statistics

To answer the first research question, descriptive statistics were computed for the student and expert scores representing the five BPPAR criteria and total scores within the recall and video groups. Based on the results, several conclusions can be made regarding the assessment scores of participants within the recall and video groups.

- Students representing both the recall and video groups and the experts assessed the criterion of dynamics the lowest. In support of this finding, the dynamic criterion was among the top answers to the following question, “Which category was the most challenging to answer on the rubric?” Students responded that they (a) did not hear as many soft dynamics in the video, and (b) the voicing of the melody did not come out as loudly as they had intended. It is recommended that young students should be encouraged to exaggerate the dynamics of a piece of music, as the dynamics often do not come out as clearly as the student had intended.

Furthermore, the application of proper self-assessment practices using the BPPAR while watching a video recording of their performance may help students to listen for appropriately performed dynamics.

- Students representing the recall and video groups assessed the criterion of style and mood the highest, while experts rated student performances for this criterion as the second lowest. This discrepancy between student and expert assessments on style and mood may be attributed to the amount of attention the teacher and student have

given to this important performance element. Some students responded that style and mood was an easy category to answer because they had discussed what was occurring within each section of their piece with their teacher. Other students responded that they had not thought about style and mood before or forgot about it while they were performing.

Teachers are encouraged to address style and mood when introducing a piece and by discussing it throughout the learning process. Teachers can also help deepen a student's understanding of style and mood by encouraging the following student activities (a) compose a story to describe the piece; (b) create a picture to depict the piece; or (d) research the composer, genre, or title of the piece.

- Students within the recall group assessed their performances more highly than the experts on all the criteria except notes. Students within the video group were more critical than the experts on the criteria of (a) notes and (b) rhythm and timing, while they assessed their performances more highly on the criteria of (a) articulation, (b) dynamics, and (c) style and mood. These findings are in alignment with the results of Hewitt's (2005) study in which middle school students (a) were most accurate when assessing melody and rhythm and (b) exhibited higher self-assessment scores when compared to a panel of experts.
- When compared with the students in the video group, the assessment scores of students within the recall group were more highly inflated than the experts' scores. Self-assessment while watching a video recording of their performance helped the piano students assess their performances in an accurate manner. This finding is in alignment with numerous other music education studies that utilized self-assessment

from an audio or video recording to more accurately evaluate musical performance achievement (Alley, 1980; Benson, 1989; Bergee, 1993, 1997; Bundy, 1987; Cassidy, 1993; Ciorba, 2006; Colwell, 1995; Furman, 1987; Kepner, 1986; Napoles & Bower, 2010; Oare, 2007; Robinson, 1993; Rohwer, 1996; Yarbrough, 1987).

Correlation Analyses

To answer the second and third research questions, correlation analyses were computed to compare student and expert scores for the five BPPAR criteria within the recall and video groups. Based on the results, several conclusions can be made regarding the intercorrelations between the variables.

- Statistically significant correlations were found between student and expert scores within both the recall ($r = .25 - .62, p < .05$) and video groups ($r = .31 - .63, p < .01$) of the same performance criterion on all BPPAR criteria, except style and mood. The students were most accurate on their assessment of (a) notes, followed by (b) articulation, (c) dynamics, and (d) rhythm and timing. These findings may indicate that young pianists are accurate assessors of their performances, especially on the self-assessment of notes ($r = .62, p < .01$ in recall group; $r = .63, p < .01$ in video group). To support this finding, the majority of students responded that the notes criterion was the easiest rubric category to answer, as they focused on note accuracy when they practiced.

The statistically significant correlations within the current study differ from the results reported by Hewitt (2005). Hewitt (a) found no statistically significant correlations between high school band students and experts' assessment scores ($r = -.12 - .21$) and (b) low to moderate correlations between middle school band students and

experts' assessment scores ($r = .20 - .38$). It is important to note that the Hewitt study focused on band students within a large classroom setting, while the current study concentrated on young pianists who study with a private teacher. It is believed the one-on-one interaction and individualized instruction characteristic of private musical instruction may lead students to more accurately self-assess, which improves musical achievement. With that said, the following points should be noted:

- Students in the present study were least accurate on their assessment of style and mood. Young piano students' assessment accuracy of style and mood may improve with maturity and increased years of piano study. Similarly, Hewitt (2010) concluded that middle school students might need additional time to become effective evaluators of their performance.
- When compared with the recall group, student self-assessment scores within the video group correlated more closely with the experts' scores for all the criteria except style and mood. This finding is in alignment with Kepner's (1986) study, which found that middle school and high schools students recognized more errors while listening to an audio recording of their performance. Kepner believed that using a recording allowed students to listen critically, without the physical demands of performing. Burrack's (2002) study also supports the practice of student self-assessment with the aid of a recording. Middle school band students who recorded and self-assessed their performances reported that the evaluation process helped them to develop (a) a deeper musical understanding, (b) an increased motivation to practice challenging portions of their music, (c) critical listening skills, and (d) a feeling of responsibility for their learning (Burrack, 2002). Accordingly, students

are encouraged to video record and self-assess their piano performances to improve their performance achievement.

Multiple Regression Analyses

In order to answer the fourth and fifth research questions, simultaneous multiple regression analyses were conducted within the recall and video groups to determine which of the following variables were statistically significant predictors of piano performance achievement: (a) age, (b) gender, (c) years of piano study, and (d) self-assessment.

- Results indicated that self-assessment ($p < .001$) was a statistically significant predictor of piano performance achievement for the recall and video groups. This finding is in alignment with other music education studies that discovered self-assessment improved performance achievement (Ciorba, 2006; Hewitt, 2001; Ross et al., 1999; Sparks, 1990).
- Additionally, gender ($p < .05$) was a statistically significant predictor of piano performance achievement within the video group. Previous research indicated gender had an impact on children's performance achievement within general education studies, in which the application of a rubric for the purpose of self-assessment (a) increased seventh-grade girl's metacognitive thinking skills (Goodrich, 1996) and (b) improved the performance scores of girls writing essays (Andrade & Boulay, 2003). Furthermore, elementary age girls understood rubric evaluation data more deeply than their male counterparts, and were twice as likely as males to report rubrics benefitting their evaluation process (Ross, Hogaboam-Gray, & Rolheiser, 2002). Perhaps utilizing the BPPAR while watching a video

recording of their musical performance helped students to more deeply reflect upon and accurately evaluate their performance. Future research will need to investigate the assessment differences among male and female participants utilizing a video recording for the purpose of self-assessment on the BPPAR.

Participants' Self-Assessment Feedback

The sixth research question asked, “What are the participants’ thoughts and suggestions on using the BPPAR for the purpose of self-assessment?” A summary of the students’ ($n = 16$) thoughts and responses provide several conclusions.

- The majority of respondents ($n = 6$) representing the subsample indicated the notes category was the easiest rubric criterion to assess. Specifically, it was an area of their playing they actively listened to while practicing and performing. This finding is in alignment with Hewitt’s (2005) results, in which middle school band students were most accurate when assessing the melodic nature of a musical performance. Students are encouraged to record their piano performances and utilize the BPPAR for the purpose of self-assessment, while giving attention to numerous performance criteria, including note accuracy.
- There was a lack of consensus when students were asked to indicate the most challenging rubric criterion to answer, as results indicated similar frequencies to (a) rhythm and timing ($n = 5$), (b) articulation ($n = 4$), (c) dynamics ($n = 4$), and (d) style and mood ($n = 4$). Teachers are encouraged to frequently assist their students in discussing and making accurate assessment decisions within piano lessons. Similarly, Hewitt (2002) stated that band directors needed to systematically guide students with their self-evaluations.

- The majority of students within this subgroup reported the rubric (a) was easy to understand, (b) included everything they needed to assess their piano performances, and (c) would be a useful tool they would utilize in their practice time at home. In addition, the BPPAR was found to be a helpful practice tool to guide students in assessing multiple performance criteria. Oare (2007) found that middle school age private music students frequently lacked specificity within their practice. Accordingly, Oare suggested that teachers provide students with a rubric, which can provide clear performance criteria for self-assessment.
- Students indicated that the video recording made it easier to hear how their performance actually sounded. Students reported to be surprised when hearing the video recording of their piano performance. Specific comments included, (a) the accompaniment sounded as loud as the melody, (b) transitions between the themes took too long, (c) the top notes of the chords were not voiced at an appropriate volume, and (d) the slurs unintentionally stopped at the bar lines. Student reported that the video recordings made it easier to evaluate their performance. This realization is reinforced by the results of the correlation analyses. When comparing both student groups (recall vs. video), it was found that the self-assessments representing the video group correlated more closely with the experts' scores.

Implications

The results of this study provide numerous implications for the field of music education, and especially for piano teachers and their students. The high reliability of the Bronson Piano Performance Achievement Rubric (BPPAR) indicates the measure

may provide piano teachers, students, and researchers with a helpful tool to improve piano performance achievement.

The results of the multiple regression analyses within the recall and video groups indicated that self-assessment was a statistically significant predictor of piano performance achievement. This finding suggests that piano students would benefit from the implementation of regular self-assessment practices with the aid of the BPPAR. Additionally, the results of the correlation analyses indicated that students within the video group were more accurate on their self-assessments compared to students within the recall group, which suggests piano students would benefit from video recording their piano performances for the purposes of self-assessment.

It is recommended these self-assessment practices occur frequently during (a) piano lessons where piano teachers can discuss, model, and shape students' accurate perceptions of piano performance achievement; and (b) the student's practice time between lessons. Oare (2007) suggested that self-assessment using a rubric might provide students with (a) specific performance criteria to guide their practice and (b) a degree of control over their assessment. As a result, students may relate their triumphs or failure to personal effort. Furthermore, Camilli (2010) found that high-achieving piano students became more autonomous in their work, which increased their motivation to practice. Similarly, Zimmerman (2005) discovered high school instrumentalists' musical self-esteem improved through the practice of self-assessment while listening to an audio recording of their performance. The implementation of consistent self-assessment procedures with the aid of a video recording may help

students to feel more autonomous, which may lead to increased motivation for practice and improvement.

The results of the multiple regression analysis within the video group indicated that gender was a statistically significant predictor of piano performance achievement. Perhaps, an explanation for this finding can come from previous research (Goodrich, 1996; Andrade & Boulay, 2003), which found that young girls attributed their evaluation scores to effort and became more self-regulating while young boys attributed evaluation feedback to ability and decreased self-regulation.

Recommendations

This is the first research study to measure predictors of young students' piano performance achievement. As a result, this study has the potential to provide numerous possibilities for future research.

1. Given that gender was a statistically significant predictor of piano performance achievement within the video group, future research could investigate the self-assessment differences between male and female students and their accuracy on the various BPPAR criteria.
2. The detailed descriptors of the BPPAR were written with language appropriate for piano students, ages 8-13. Accordingly, future research could modify and enhance the BPPAR to become a useful practice tool for older piano students. This process could be assisted by asking the entire sample of student participants to provide feedback regarding the self-assessment procedures.

3. Future research could utilize a broader age range to determine if differences in the self-assessment process exist among students within the following categories: (a) elementary, (b) middle school, and (c) high school.
4. Replicating this study using a broader age range sample would also provide the opportunity to study the self-assessment differences between students who had studied piano for various lengths of time.
5. Future research could investigate other variables that account for the variance in piano performance achievement. Variables of interest include motivation and self-efficacy. This could lead to the development of a path analytical model to fully examine the direct and indirect effects among the selected variables that predict piano performance achievement.

The findings of this study contribute to the current music education literature by (a) providing piano students, piano teachers, and future researchers with a reliable self-assessment measure; (b) supporting the inclusion of self-assessment practices within lessons and practice time; and (c) supporting the practice of video recording musical performances to more accurately self-assess performance achievement.

Conclusion

The results of the study revealed that young piano students ranging from ages 8-13 could indeed be accurate self-assessors of their musical performances. Student assessment accuracy utilizing the Bronson Piano Performance Achievement Rubric (BPPAR) was found among students assessing from their recall, with improved accuracy occurring among students assessing while watching a video recording of their performance. Furthermore, age was not a statistically significant predictor, indicating

that even at a young age private piano students can be trained to accurately assess their musical performances. It is strongly believed that the one-on-one interaction and individualized instruction characteristic of the private music studio can lead students to accurately self-assess their performances, resulting in improved piano performance achievement. It is hoped that this and future research will encourage music educators to continue to develop students that are independent and lifelong musicians.

References

- Aitchison, R. A. (1995). The effects of self-evaluation techniques on the musical performance, self-evaluation accuracy, motivation, and self-esteem of middle school instrumental music students. (Doctoral dissertation, The University of Iowa). *Dissertation Abstracts International, Section A. Humanities and Social Sciences*, 67(11), 3875.
- Alley, J. M. (1980). The effect of self-analysis of videotapes on selected competencies of music therapy majors. *Journal of Music Therapy*, 17, 113-132.
doi:10.1093/jmt/17.3.113
- Andrade, B. G. & Boulay, B. A. (2003). Role of rubric-referenced self-assessment in learning how to write. *The Journal of Educational Research*, 97(1), 21-30.
doi:10.1080/00220670309596625
- Asmus, E. (1999). *Rubrics: Definitions, benefits, history and types*. Retrieved June 27, 2013 from <http://www.music.miami.edu/assessment/rubricsdef.html>.
- Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and human Decision Processes*, 50, 248-287. Retrieved from <http://www.sciencedirect.com>. doi:10.1016/0749-5978(91)90022-L
- Barry, N. H. (2009/2010). Evaluating music performance: Politics, pitfalls, and successful practices. *College Music Symposium*, 49/50, 246-256.
- Benson, W. L. (1989). The effect of models, self-observation, and evaluation on the modification of specified teaching behaviors of an applied music teacher. *Update: Applications of Research in Music Education*, 7(2), 28-31.
doi:10.1177/875512338900700210
- Bergee, M. J. (1987). An application of the facet-factorial approach to scale construction in the development of a rating scale for euphonium and tuba music performance. (Doctoral dissertation, University of Kansas). *Dissertation Abstracts International, Section A. Humanities and Social Sciences*, 49(05), 1086.
- Bergee, M. J. (1993). A comparison of faculty, peer, and self-evaluation of applied brass jury performance. *Journal of Research in Music Education*, 41(1), 19-27. Retrieved from <http://www.jstor.org>. doi:10.2307/3345476
- Bergee, M. J. (1997). Relationships among faculty, peer, and self-evaluation of applied performance. *Journal of Research in Music Education*, 45(4), 601-612. Retrieved from <http://www.jstor.org>. doi:10.2307/3345425

- Bergee, M. J. (2003). Faculty interjudge reliability of music performance evaluation. *Journal of Research in Music Education*, 51(2), 137-150. Retrieved from <http://jrm.sagepub.com>. doi:10.2307/3345847
- Bobbette, M. M. (1999). Portfolios in a preservice teacher field-based program: Evolution of a rubric for performance assessment. *Education*, 119(3), 416-426.
- Bower, G. H. & Hilgard, E. R. (1981). *Theories of learning*, (5th ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Brookhart, S. M., Andolina, M., Zuza, M., & Furman, R. (2004). Minute math: An action research study of student self-assessment. *Educational studies in mathematics*, 57(2), 213-227. Retrieved from <http://www.jstor.org>. doi:10.1023/b:educ.0000049293.55249.d4
- Bundy, O. R. (1987). Junior high wind instrumentalists' perception of their performance as measured by detection of pitch and rhythm errors under live and recorded conditions (Unpublished doctoral dissertation). Pennsylvania State University.
- Burrack, F. (2002). Enhanced assessment in instrumental programs. *Music Educators Journal*, 88(6), 27-32. Retrieved from <http://jrm.sagepub.com>. doi:10.2307/3399802
- Byo, J. L. & Brooks, R. (1994). A comparison of junior high musicians' and music educators' performance evaluations of instrumental music. *Contributions to Music Education*, 21, 26-38. Retrieved from <http://www.jstor.org/stable/24134184>
- Camilli, T. C. (2010). Parental and personality factors that predict students' length of piano study (Doctoral dissertation, The University of Oklahoma). *Dissertation Abstracts International, Section A. Humanities and Social Sciences*, 72(01).
- Cassidy, J. W. (1993). A comparison between students' self-observation and instructor observation of teacher intensity behaviors. *Bulletin of the Council for Research in Music Education*, 115, 15-29. Retrieved from <http://www.jstor.org/stable/40318745>
- Ciorba, C. R. (2006). The creation of a model to predict jazz improvisation achievement (Doctoral dissertation, The University of Miami). *Dissertation Abstracts International, Section A. Humanities and Social Sciences*, 67(11).
- Ciorba, C. R. & Smith, N. Y. (2009). Measurement of instrumental and vocal undergraduate performance juries using a multidimensional assessment rubric. *Journal of Research in Music Education*, 57(1), 5-15. Retrieved from <http://www.jstor.org>. doi:10.1177/0022429409333405

- Colwell, C. M. (1995). Effect of teaching setting and self-evaluation on teacher intensity behaviors. *Journal of Research in Music Education*, 43(1), 6-21. Retrieved from <http://www.jstor.org>. doi:10.2307/3345788
- Cooksey, J. M. (1977). A facet-factorial approach to rating high school choral music performance. *Journal of Research in Music Education*, 25(2), 100-114. doi:10.2307/3345190
- Cooksey, J. M. (1982). Developing an objective approach to evaluating music performance. In R. Colwell (Ed.), *Symposium in Music Education: A Festschrift for Charles Leonard* (pp. 197-229). Urbana, IL: University of Illinois, Champaign-Urbana.
- Davis, L. M. (1981). The effects of structured singing activities and self-evaluation practice on elementary band students' instrumental music performance, melodic tonal imagery, self-evaluation, and attitude. (Doctoral dissertation, Ohio State University). *Dissertation Abstracts International, Section A. Humanities and Social Sciences*, 42(7), 3051.
- Deci, E. L. & Ryan, R. M. (1980). The empirical exploration of intrinsic motivational processes. In L. Berkowitz (Ed.), *Advances in experimental social psychology*. New York: Academic Press. doi:10.1016/s0065-2601(08)60130-6
- Dweck, C. S., & Bush, E. S. (1976). Sex differences in learned helplessness: I. Differential debilitation with peer and adult evaluators. *Developmental Psychology*, 12(2), 147-156. Retrieved from <http://ehis.ebscohost.com>. doi:10.1037/0012-1649.12.2.147
- Dweck, C. S., Davidson, W., Nelson, S., & Enna, B. (1978). Sex differences in learned helplessness: II. The contingencies of evaluative feedback in the classroom and III. An experimental analysis. *Developmental Psychology*, 14(3), 268-276. Retrieved from <http://ehis.ebscohost.com>. doi:10.1037/0012-1649.14.3.268
- Furman, C. E. (1987). Behavior checklists and videotapes versus standard instructor feedback in the development of a music teaching competency. In C. K. Madsen & C. A. Prickett (Eds.), *Applications of Research in Music Behavior*, (73-98). Tuscaloosa: The University of Alabama Press.
- Goodrich, H. W. (1996). Student self-assessment: At the intersection of metacognition and authentic assessment. (Doctoral dissertation, Harvard University). *Dissertation Abstracts International, Section A. Humanities and Social Sciences*, 57(7), 2854.
- Hale, C. L. & Green, S. K. (2009). Six key principles for music assessment. *Music Educators Journal*, 95(4), 27-31. Retrieved from <http://www.jstor.org>. doi:10.1177/0027432109334772

- Hewitt, M. P. (2001). The effects of modeling, self-evaluation, and self-listening on junior high instrumentalists' music performance and practice attitude. *Journal of Research in Music Education*, 49(4), 307-322. Retrieved from <http://www.jstor.org>. doi:10.2307/3345614
- Hewitt, M. P. (2002). Self-evaluation tendencies of junior high instrumentalists. *Journal of Research in Music Education*, 50(3), 215-226. Retrieved from <http://jrm.sagepub.com>. doi:10.2307/3345799
- Hewitt, M. P. (2005). Self-evaluation accuracy among high school and middle school instrumentalists. *Journal of Research in Music Education*, 53(2), 148-161. Retrieved from <http://www.jstor.org>. doi:10.1177/002242940505300205
- Hewitt, M. P. (2010). The impact of self-evaluation instruction on student self-evaluation, music performance, and self-evaluation accuracy. *Journal of Research in Music Education*, 59(1), 6-20. Retrieved from <http://jrm.sagepub.com>. doi:10.1177/0022429410391541
- Hollander, E. P. & Marcia, J. E. (1970). Parental determinants of peer-orientation and self-orientation among preadolescents. *Developmental Psychology*, 2(2), 292-302. Retrieved from <http://ehis.ebscohost.com>. doi:10.1037/h0028749
- Keith, T. Z. (2006). *Multiple regression and beyond*. Boston: Pearson Education, Inc.
- Kepner, C. B. (1986). The effect of performance familiarity, listening condition, and type of performance error on correctness of performance error detection by 50 high school instrumentalists as explained through sensory blocking theory (Unpublished doctoral dissertation). Kent State University.
- Kostka, M. J. (1997). Effects of self-assessment and successive approximations on "knowing" and "valuing" keyboard skills. *Journal of Research in Music Education*, 45(2), 273-281. Retrieved from <http://www.jstor.org>. doi:10.2307/3345586
- Latimer, M. E., Bergee, M. J., & Cohen, M. L. (2010). Reliability and perceived pedagogical utility of a weighted music performance assessment rubric. *Journal of Research in Music Education*, 58(2), 168-184. Retrieved from <http://www.jstor.org>. doi:10.1177/0022429410369836
- Madsen, C. K. & Yarbrough, C. (1985). *Competency-based music education*. Raleigh, NC: Contemporary.
- Morrison, S. J., Montemayor, M., & Wiltshire, E.S. (2004). The effect of a recorded model on band students' performance self-evaluations, achievement, and attitude. *Journal of Research in Music Education*, 52(2), 116-129. doi:10.2307/3345434

- Napoles, J. (2008). Relationships among instructor, peer, and self-evaluations of undergraduate music education majors' micro-teaching experiences. *Journal of Research in Music Education* 56(1), 82-92. doi:10.1177/0022429408323071
- Napoles, J. & Bowers, J. (2010). Differential effects of instructor feedback vs. self-observation analysis on music education majors' increase of specific reinforcement in choral rehearsals. *Bulletin of the Council for Research in Music Education*, 183, 39-48. Retrieved from <http://www.jstor.org/stable/27861471>.
- Norris, C. E. & Borst, J. D. (2007). An examination of the reliabilities of two choral festival adjudication forms. *Journal of Research in Music Education*, 55(3), 237-251. Retrieved from <http://jrm.sagepub.com>. doi:10.1177/002242940705500305
- Oare, S. (2011). Practice education: Teaching instrumentalists to practice effectively. *Music Educators Journal*, 97(3), 41-47. Retrieved from <http://jrm.sagepub.com>. doi:10.1177/0027432111400006
- Oare, S. R. (2007). Goals and self-assessment in the middle school learner: A study of music practice habits. (Doctoral dissertation, Michigan State University). *Dissertation Abstracts International, Section A. Humanities and Social Sciences*, 68(9).
- Riley, K. (2007, July). The art of listening: Putting first things first. *Piano Pedagogy Forum*, 10(2). Retrieved from <http://www.music.sc.edu/ea/Keyboard/PPF>.
- Robinson, C. (1993). Singers' self-assessment of choral performance: Next-day recollection versus concert tape evaluation. *Southeastern Journal of Music Education*, 4, 224-233.
- Rohwer, M. (1996). The effect of listening to concert recording of singers' self-evaluation of choral performance. *Missouri Journal of Research in Music Education*, 33, 10-27.
- Ross, J. A., Hogaboam-Gray, A., & Rolheiser, C. (2002). Student self-evaluation in grades 5-6 mathematics effects on problem-solving achievement. *Educational Assessment* 8(1), 43-49. doi:10.1207/s15326977ea0801_03
- Ross, J. A., Rolheiser, C., & Hogaboam-Gray, Anne. (1999). Effects of self-evaluation training on narrative writing. *Assessing Writing*, 6(1), 107-132. doi:10.1016/s1075-2935(99)00003-3
- Ross, J. A., Rolheiser, C., & Hogaboam-Gray, Anne. (2002). Influences on student cognitions about evaluation. *Assessment in Education*, 9(1), 81-95. doi:10.1080/09695940220119201

- Saunders, T. C. & Holahan, J. M. (1997). Criteria-specific rating scales in the evaluation of high school instrumental performance. *Journal of Research in Music Education*, 45(2), 259-272. Retrieved from <http://www.jstor.org>. doi:10.2307/3345585
- Schunk, D. H. (1996). Goal and self-evaluative influences during children's cognitive skill learning. *American Educational Research Journal*, 33(2), 359-382. Retrieved from <http://www.jstor.org>. doi:10.3102/00028312033002359
- Scott, S. J. (2012). Rethinking the roles of assessment in music education. *Music Educators Journal*, 98(3), 31-35. Retrieved from <http://jrm.sagepub.com>. doi:10.1177/0027432111434742
- Sparks, G. E. (1990). The effect of self-evaluation on musical achievement, attentiveness, and attitudes of elementary school instrumental students. (Doctoral dissertation, Louisiana State University). *Dissertation Abstracts International, Section A. Humanities and Social Sciences*, 51(9), 3009.
- Stipek, D. & Seal, K. (2001). *Motivated Minds: Raising Children to Love Learning*. New York, NY: Holt Paperbacks.
- Vispoel, W. P. (1992). *Arts Self-Perception Inventory (Adolescent Form)*. Iowa City, IA: Author.
- Watkins, J. G., & Farnum, S. E. (1962). *The Watkins-Farnum performance scale, form B: Standardized achievement test for all band instruments*. Winona, MN: Hal Leonard Music.
- Wapnick, J., Flowers, P., Alegant, M., & Jasinkas, L. (1993). Consistency in piano performance evaluation. *Journal of Research in Music Education*, 41(4), 282-292. Retrieved from <http://jrm.sagepub.com>. doi:10.2307/3345504
- Wesolowski, B. C. (2012). Understanding and developing rubrics for music performance assessment. *Music Educators Journal*, 98(3), 36-42. Retrieved from <http://jrm.sagepub.com>. doi:10.1177/0027432111432524
- Yarbrough, C. (1987). The relationship of behavioral self-assessment to the achievement of basic conducting skills. *Journal of Research in Music Education*, 35(3), 183-189. Retrieved from <http://www.jstor.org>. doi:10.2307/3344960
- Zimmerman, J. R. (2005). The effects of periodic self-recording, self-listening and self-evaluation on the motivation and music self-concept of high school instrumentalists. (Doctoral dissertation, The University of Minnesota). *Dissertation Abstracts International, Section A. Humanities and Social Sciences*, 66(10).

Appendix A

IRB Pilot Study Approval Letter



Institutional Review Board for the Protection of Human Subjects

Approval of Initial Submission – Expedited Review – AP01

Date: March 16, 2015

IRB#: 5100

Principal Investigator: Janci L. A. Bronson

Approval Date: 03/16/2015

Expiration Date: 02/29/2016

Study Title: Student Pianists' Self-Assessment Accuracy of Live and Recorded Performances

Expedited Category: 6 & 7

Collection/Use of PHI: No

On behalf of the Institutional Review Board (IRB), I have reviewed and granted expedited approval of the above-referenced research study. To view the documents approved for this submission, open this study from the *My Studies* option, go to *Submission History*, go to *Completed Submissions* tab and then click the *Details* icon.

As principal investigator of this research study, you are responsible to:

- ☐ Conduct the research study in a manner consistent with the requirements of the IRB and federal regulations 45 CFR 46.
- ☐ Obtain informed consent and research privacy authorization using the currently approved, stamped forms and retain all original, signed forms, if applicable.
- ☐ Request approval from the IRB prior to implementing any/all modifications.
- ☐ Promptly report to the IRB any harm experienced by a participant that is both unanticipated and related per IRB policy.
- ☐ Maintain accurate and complete study records for evaluation by the HRPP Quality Improvement Program and, if applicable, inspection by regulatory agencies and/or the study sponsor.
- ☐ Promptly submit continuing review documents to the IRB upon notification approximately 60 days prior to the expiration date indicated above.

☐ Submit a final closure report at the completion of the project. If you have questions about this notification or using iRIS, contact the IRB @ 405-325-8110 or irb@ou.edu.

Cordially,



Fred Beard, Ph.D.
Vice Chair, Institutional Review Board

Appendix B

Pilot Study Bronson Piano Performance Achievement Rubric (BPPAR) Student Self-Assessment Form

For each category, please circle the one box that best describes your performance.

CATEGORY	Needs Improvement	Okay	Good	Excellent	Outstanding
<u>NOTES</u> <ul style="list-style-type: none"> • Playing the correct notes 	Correct notes were rarely played.	Correct notes were sometimes played.	Correct notes were often played.	Correct notes were almost always played.	Correct notes were always played.
<u>RHYTHM AND TIMING</u> <ul style="list-style-type: none"> • Correct rhythms & rests • Steady beat • Correct use of expressive timings: Ritard. & accelerando 	Correct rhythm and timing was rarely played.	Correct rhythm and timing was sometimes played.	Correct rhythm and timing was often played.	Correct rhythm and timing was almost always played.	Correct rhythm and timing was always played.
<u>ARTICULATION</u> <ul style="list-style-type: none"> • Staccatos played short & bouncy • Slurs played smooth & connected • Accents played louder 	Articulations were rarely played.	Articulations were sometimes played.	Articulations were often played.	Articulations were almost always played.	Articulations were always played.

CATE- GORY	Needs Improve- ment	Okay	Good	Excellent	Outstand- ing
<u>DYNA- MICS</u> <ul style="list-style-type: none"> • Big difference between louds & softs • Correct crescendos & diminuendos • Melody is played louder than the other notes (voicing) 	Dynamics were rarely used.	Dynamics were sometimes used.	Dynamics were often used.	Dynamics were almost always used.	Dynamics were always used.
<u>STYLE AND MOOD</u> <ul style="list-style-type: none"> • The performance represents the correct character and emotion of the music. 	The style and mood was rarely present in the performance.	The style and mood was sometimes present in the performance.	The style and mood was often present in the performance.	The style and mood was almost always present in the performance.	The style and mood was always present in the performance.

Student Participant Number: _____

Repertoire Title: _____ Repertoire Composer: _____

Appendix C

Pilot Study Bronson Piano Performance Achievement Rubric (BPPAR) Expert Assessment Form

For each category, please circle the one box that best describes your performance.

CATEGORY	Needs Improve- ment	Okay	Good	Excellent	Out- standing	Score
<u>NOTES</u> <ul style="list-style-type: none"> • Playing the correct notes 	Correct notes were rarely played.	Correct notes were sometimes played.	Correct notes were often played.	Correct notes were almost always played.	Correct notes were always played.	
<u>RHYTHM AND TIMING</u> <ul style="list-style-type: none"> • Correct rhythms & rests • Steady beat • Correct use of expressive timings: Ritard. & accelerando 	Correct rhythm and timing was rarely played.	Correct rhythm and timing was sometimes played.	Correct rhythm and timing was often played.	Correct rhythm and timing was almost always played.	Correct rhythm and timing was always played.	
<u>ARTICULATION</u> <ul style="list-style-type: none"> • Staccatos played short & bouncy • Slurs played smooth & connected • Accents played louder 	Articulations were rarely played.	Articulations were sometimes played.	Articulations were often played.	Articulations were almost always played.	Articulations were always played.	

CATE- GORY	Needs Improve- ment	Okay	Good	Excellent	Out- standing	Score
<u>DYNAMICS</u> <ul style="list-style-type: none"> • Big difference between louds & softs • Correct crescendos & diminuendos • Melody is played louder than the other notes (voicing) 	Dynamics were rarely used.	Dynamics were sometimes used.	Dynamics were often used.	Dynamics were almost always used.	Dynamics were always used.	
<u>STYLE AND MOOD</u> <ul style="list-style-type: none"> • The performance represents the correct character and emotion of the music. 	The style and mood was rarely present in the performance.	The style and mood was sometimes present in the performance.	The style and mood was often present in the performance.	The style and mood was almost always present in the performance.	The style and mood was always present in the performance.	

TOTAL SCORE: ____

Student Participant Number: _____

Repertoire Title: _____

Repertoire Composer: _____

Repertoire Collection (if applicable): _____

Appendix D

Pilot Study Recruitment E-mail to PI's Piano Studio

Dear parents of piano students,

Your 8-13 year-old children have the opportunity to participate in my dissertation research study. Please read the detailed descriptions on the attached parental consent forms and student assent forms.

If you choose to have your child participate, piano students will perform a piano piece at their lesson that they have been working on (memory not required) while being video-recorded on a laptop. One group of students will watch the video of their performance and complete self-assessment on the attached rubric. The other group of students will not watch their performance video, but self-assess based on how well they remembered playing. I will watch all the performance videos and assess the students' playing on the same rubric. The entire process should take no longer than 10 minutes of your child's lesson time.

It is my hope that the process of video-recording their performance and completing self-assessment on the rubric will be a helpful practice tool to your children.

Because this study includes the unusual step of having a researcher—in this case, me, your child's piano teacher—recruit and collect data from her own students, it is especially important that you discuss the study with your child and make certain that he or she feels no special pressure or obligation to be a participant. Please read over the attached parental permission and child assent documents and if you and your child choose to participate in this study, please answer the questions on the questionnaire that can be found at the following link.

https://qtrial2015az1.az1.qualtrics.com/SE/?SID=SV_9yqQBJV6ODksiJD (Click on the blue link to direct you to the survey. If that does not work, copy and paste the link into your internet browser.)

Please contact me with any questions or concerns. Thank you for your time and consideration of participating in this research!

Sincerely,

Janci L. A. Bronson
Ph.D. candidate at the University of Oklahoma
jlabronson@ou.edu

The University of Oklahoma is an Equal Opportunity Institution.

Appendix E

Pilot Study Recruitment E-mail to KSP's Piano Studio

Dear parents of piano students,

Your 8-13 year-old children have the opportunity to participate in my dissertation research study. I am a Ph.D. candidate at the University of Oklahoma and a piano lecturer at Iowa State University. Your piano teacher, Mrs. Pam Sibbel, is also assisting with this study. Please read the detailed descriptions on the attached parental consent forms and student assent forms.

If you choose to have your child participate, piano students will perform 1 piano piece at their lesson that they have been working on (memory not required) while Mrs. Sibbel video-records them on a laptop. One group of students will watch the video of their performance and complete self-assessment on the attached rubric. The other group of students will not watch their performance video, but self-assess based on how well they remembered playing. Janci Bronson will watch all the performance videos at a later time and assess the students' playing on the same rubric. The entire process should take no longer than 10 minutes of your child's lesson time.

It is my hope that the process of video-recording their performance and completing self-assessment on the rubric will be a helpful practice tool to your children.

Because this study includes the unusual step of having your child's piano teacher, Mrs. Sibbel, collect data from her own students, it is especially important that you discuss the study with your child and make certain that he or she feels no special pressure or obligation to be a participant. Please read over the attached parental permission and child assent documents and if you and your child choose to participate in this study, please answer the questions on the questionnaire that can be found at the following link.

https://qtrial2015az1.az1.qualtrics.com/SE/?SID=SV_9yqQBJV6ODksiJD (Click on the blue link to direct you to the survey. If that does not work, copy and paste the link into your Internet browser.) For parents with multiple children taking piano lessons, please complete a survey for each child.

Please contact Janci Bronson, jlabronson@ou.edu, (cell) 515-xxx-xxxx with any questions or concerns. Thank you for your time and consideration of participating in this research!

Sincerely,

Janci L. A. Bronson,
Ph.D. candidate at the University of Oklahoma

The University of Oklahoma is an Equal Opportunity Institution.

Appendix F

Pilot Study IRB Assent Document for Child Participants

**University of Oklahoma
Institutional Review Board
Assent to Participate in a Research Study
(For children 7-12 years old)**

Project Title: Student Pianists' Self-Assessment Accuracy of Live and Recorded Performances

Principal Investigator: Janci Bronson

Department: Music

IRB NUMBER: 5100

IRB APPROVAL DATE: 03/16/2015

IRB EXPIRATION DATE: 02/29/2016



Why are we meeting with you?

We are doing a study to learn about how well kids listen while they play the piano. We want to find out how accurate you think you are on playing the correct 1) notes, 2) rhythm and timings, 3) articulations, 4) dynamics, and 5) style and mood of the music. Also, some of you will watch a video of your piano solo, so we want to see if that makes it easier to listen and evaluate your performance. We are asking you to help because we want to learn from kids like you. In the whole study, there will be about thirty children, from ages 8-13 who are taking piano lessons.

What will happen to you if you are in this study?

If you agree to be in this study, we are going to ask you to play one piano solo, which does not need to be memorized. The piano solo does not need to be perfect, but should be a song that you are still working on. Once you finish playing your song, you will fill out a form, called a rubric, where you circle answers about how well you think you played the 1) notes, 2) rhythm and timings, 3) articulations, 4) dynamics, and 5) style and mood of the music. Half of the students will also watch a video of their performance on a laptop to help them answer the same questions about how well they think they played.

How long will you be in the study?

You will be in the study for one lesson at your piano teacher's studio. Participation in this study should only take about 10 minutes of your lesson time. At a later date, you will have the opportunity to participate again.

What bad things might happen to you if you are in the study?

No bad things will happen to you. The questions might take a bit of time to answer. You might feel a little nervous when you perform, like how you would for a piano recital.

What good things might happen to you if you are in the study?

You might learn of a good and fun way to practice the piano. Also, you will be helping other piano students and teachers learn of valuable ways to enhance their piano lessons and practice.

Do you have to be in this study?

No, you don't. No one will be mad at you if you don't want to do this. If you don't want to be in this study, just tell us. Or if you do want to be in the study, tell us that. And, remember, you can say yes now and change your mind later. It's up to you. It's a little unusual for your piano teacher to be involved in a study that includes her own students. So before you decide you want to be in the study, it's especially important that you have discussed the study with your parents and that you don't feel any special pressure or obligation to be a participant.

Your Mom or Dad will also have to give permission for you to be in this study.

Do you have any questions?

You can ask questions any time. You can ask now. You can ask later. You can talk to me or you can talk to someone else.

If you type your name on the electronic survey, it means that you have read this form and want to be in the study. If you don't want to be in the study, don't sign the electronic survey. Being in the study is up to you, and no one will be upset if you don't sign the survey or if you change your mind later.

Please print this document if you'd like to keep it for your records.

Please answer the below responses on the electronic survey:

Signature of Child

Date

SIGNATURE OF PERSON CONDUCTING ASSENT DISCUSSION

I have explained the study to _____ (*print name of child here*) in language he/she can understand, and the child has agreed to be in the study.

Signature of Person Conducting Assent Discussion

Date

Name of Person Conducting Assent Discussion (*print*)

Appendix G

Pilot Study IRB Consent Document

**University of Oklahoma
Institutional Review Board
Informed Consent to Participate in a Research Study**

Project Title: Student Pianists' Self-Assessment Accuracy of Live and Recorded Performances

Principal Investigator: Janci Bronson

Department: Music

IRB NUMBER: 5100

IRB APPROVAL DATE: 03/16/2015

IRB EXPIRATION DATE: 02/29/2016



You are being asked to give permission for your child to volunteer for this research study. This study is being conducted at the piano studio of your child's piano teacher. Your child was selected as a possible participant because they are an eight to thirteen year-old that take piano lessons.

Please read this form and ask any questions that you may have before agreeing to allow your child to take part in this study.

Purpose of the Research Study

The purpose of this study is to provide young piano students with a way to critically listen and self-assess their piano performance. All of the participants will self-assess a piano solo on a piano performance achievement rubric, which evaluates the accuracy of 1) notes, 2) rhythm and timing, 3) articulation, 4) dynamics, and the 5) style and mood of the music. Additionally, half of the participants will self-assess after watching a video recording of their performance.

Number of Participants

About 30 total piano students will take part in this study. Half of the participants will self-assess after performing a piano solo. The other half of the participants will self-assess after watching a video of their piano performance.

Procedures

If you agree to allow your child to be in this study, your child will be asked to perform a piano solo and self-assess their performance on a rubric. It is not necessary for the piano solo to be memorized. Students within the experimental group will additionally watch a

video recording of their piano performance to assist their self-assessment on a rubric.

Length of Participation

Your child's participation in this project will briefly take place at one private lesson. The amount of time depends on the length of their piano solo and how much time it takes them to evaluate five-performance criterion. Students should not need to spend any longer than ten minutes on this project.

Risks of being in the study are none.

Benefits of being in the study are providing your child with a process to critically listen and self-assess their piano performance while practicing at home.

Compensation

Your child will not be reimbursed for his/her time and participation in this study.

Confidentiality

In published reports, there will be no information included that will make it possible to identify your child without your permission. Research records will be stored securely and only approved researchers will have access to the records.

There are organizations that may inspect and/or copy your research records for quality assurance and data analysis. These organizations include the OU Institutional Review Board.

Voluntary Nature of the Study

Because this study includes the unusual step of having your child's piano teacher collect data from her own students, it is especially important that you discuss the study with your child and make certain that he or she feels no special pressure or obligation to be a participant. Participation in this study is voluntary. If your child withdraws or declines participation, he/she will not be penalized or lose benefits or services unrelated to the study. If your child decides to participate, he/she may decline to answer any question and may choose to withdraw at any time.

Waivers of Elements of Confidentiality

Your child's name will not be retained or linked with his/her responses unless you agree and he/she specifically agree to be identified. The data your child provides will be retained in anonymous form unless you and your child specifically agree for data retention or retention of contact information beyond the end of the study.

Please read through all of the following questions and make your responses on the electronic survey linked at the bottom of the recruitment e-mail.

I consent to my child being quoted directly. ____ Yes ____ No

I consent to having my child's name reported with quoted material. ____ Yes ____ No

I consent to having the information my child provided retained for potential use in future studies by this researcher. ____ Yes ____ No

I consent to having my child's contact information retained after the study so that she/he can be contacted to participate in future studies. ____ Yes ____ No

Video Recording of Study Activities

To assist with accurate recording of your child's responses, your child's piano performance of one piano solo will be recorded on a video recording device. You and your child have the right to refuse to allow such recording. If you do not agree to video recording, you cannot participate in this study. Please select one of the following options:

I consent to video recording. ____ Yes ____ No

Future Communications

The researcher would like to contact you child again to recruit him/her into this study or to gather additional information.

_____ I give my permission for the researcher to contact my child in the future.

_____ I do not wish for my child to be contacted by the researcher again.

Contacts and Questions

If you have concerns or complaints about the research, the researcher, Janci Bronson, conducting this study can be contacted at 515-XXX-XXXX, jlaborson@ou.edu. Additionally, you may contact the faculty sponsor, Dr. Charles Ciorba at cciorba@ou.edu. Contact the researcher(s) if you have questions, or if you have experienced a research-related injury.

If you have any questions about your child's rights as a research participant, concerns, or complaints about the research and wish to talk to someone other than individuals on the research team or if you cannot reach the research team, you may contact the University of Oklahoma – Norman Campus Institutional Review Board (OU-NC IRB) at 405-325-8110 or irb@ou.edu. *Please print a copy of this document if you would like to keep it for your records.*

Statement of Consent

I have read the above information. I have asked questions and have received satisfactory answers. I consent for my child to participate in the study.

Parent's Signature _____ Print Name Date _____

Parent's E-mail _____

Parent's Phone Number _____

Child's Name (print) _____

Signature of Person Obtaining Consent _____ Date _____

Print Name of Person Obtaining Consent _____

Signature of Witness (if applicable) _____ Date _____

Print Name of Witness _____

Appendix H

Pilot Study Qualtrics Consent Questionnaire

I consent to my child being quoted directly.

- ☐ Yes
- ☐ No

I consent to having my child's name reported with quoted material.

- ☐ Yes
- ☐ No

I consent to having the information my child provided retained for potential use in future studies by this researcher.

- ☐ Yes
- ☐ No

I consent to having my child's contact information retained after the study so that she/he can be contacted to participate in future studies.

- ☐ Yes
- ☐ No

I consent to video recording.

- ☐ Yes
- ☐ No

I give my permission for the researcher to contact my child in the future.

- ☐ Yes
- ☐ No

I have read the consent document attached to the recruitment e-mail. I have asked questions and have received satisfactory answers. I consent for my child to participate in the study. If you consent to have your child participate in this study, please type the appropriate information in each of the below boxes.

- ☐ Parent's Full Name _____
- ☐ Child's Full Name _____
- ☐ Date _____
- ☐ Child's Gender _____
- ☐ Child's Age _____
- ☐ Child's number of years taking piano lessons _____
- ☐ Parent's E-mail Address _____
- ☐ Parent's Phone Number _____

This question should be answered by your child:

By typing your name below, it means that you have read the student assent document and want to be in the study. If you don't want to be in the study, don't type your name below. Being in the study is up to you, and no one will be upset if you don't type your name below or if you change your mind later. Please fill out each of the below boxes if you want to participate in this study.

- ☐ Child's Full Name _____
- ☐ Date _____

By typing your name below, you are verifying that you have explained the study to your child in language he/she can understand and the child has agreed to be in the study. Please fill out each of the below boxes if your child has agreed to be in the study.

- ☐ Full Name of Parent Conducting Assent Discussion _____
- ☐ Date _____

You may print a copy of this survey with your responses to keep for your records. Thank you!

Appendix I

IRB Main Study Approval Letter



The UNIVERSITY of OKLAHOMA

Institutional Review Board for the Protection of Human Subjects

Approval of Initial Submission – Expedited Review – AP01

Date: November 10, 2015

IRB#: 6120

Principal Investigator: Janci L. A. Bronson, MM

Approval Date: 11/10/2015

Expiration Date: 10/31/2016

Study Title: Main Study: Predictors of Performance Achievement Among Young Pianists

Expedited Category: 6 & 7

Collection/Use of PHI: No

On behalf of the Institutional Review Board (IRB), I have reviewed and granted expedited approval of the above- referenced research study. To view the documents approved for this submission, open this study from the My Studies option, go to Submission History, go to Completed Submissions tab and then click the Details icon.

As principal investigator of this research study, you are responsible to:

- ☐ Conduct the research study in a manner consistent with the requirements of the IRB and federal regulations 45 CFR 46.
- ☐ Obtain informed consent and research privacy authorization using the currently approved, stamped forms and retain all original, signed forms, if applicable.
- ☐ Request approval from the IRB prior to implementing any/all modifications.
- ☐ Promptly report to the IRB any harm experienced by a participant that is both unanticipated and related per IRB policy.
- ☐ Maintain accurate and complete study records for evaluation by the HRPP Quality Improvement Program and, if applicable, inspection by regulatory agencies and/or the study sponsor.
- ☐ Promptly submit continuing review documents to the IRB upon

notification approximately 60 days prior to the expiration date indicated above.

☐ Submit a final closure report at the completion of the project. If you have questions about this notification or using iRIS, contact the IRB @ 405-325-8110 or irb@ou.edu.

Cordially,



Fred Beard, Ph.D.
Vice Chair, Institutional Review Board

Appendix J

IRB Main Study Approval Letter of Study Modification One



Institutional Review Board for the Protection of Human Subjects

Approval of Study Modification – Expedited Review – AP0

Date: January 14, 2016

IRB#: 6120

Principal Investigator: Janci L A Bronson, MM

Reference No: 647224

Study Title: Main Study: Predictors of Performance Achievement Among Young Pianists.

Approval Date: 01/14/2016

Modification Description: Adding Key Study Personnel: Christy Kiespert & Jennifer Tripi.

The review and approval of this submission is based on the determination that the study, as amended, will continue to be conducted in a manner consistent with the requirements of 45 CFR 46.

To view the approved documents for this submission, open this study from the My Studies option, go to Submission History, go to Completed Submissions tab and then click the Details icon.

If the consent form(s) were revised as a part of this modification, discontinue use of all previous versions of the consent form.

If you have questions about this notification or using iRIS, contact the HRPP office at (405) 325-8110 or irb@ou.edu. The HRPP Administrator assigned for this submission: Nicole A Cunningham.

Cordially,

Fred Beard, Ph.D.
Vice Chair, Institutional Review Board

Appendix K

IRB Main Study Approval Letter of Study Modification Two



Institutional Review Board for the Protection of Human Subjects

Approval of Study Modification – Expedited Review – AP0

Date: February 23, 2016

IRB#: 6120

Principal Investigator: Janci L A Bronson, MM

Reference No: 649228

Study Title: Main Study: Predictors of Performance Achievement Among Young Pianists.

Approval Date: 02/23/2016

Modification Description: Adding Key Study Personnel: Daniel Mockenhaupt.

The review and approval of this submission is based on the determination that the study, as amended, will continue to be conducted in a manner consistent with the requirements of 45 CFR 46.

To view the approved documents for this submission, open this study from the My Studies option, go to Submission History, go to Completed Submissions tab and then click the Details icon.

If the consent form(s) were revised as a part of this modification, discontinue use of all previous versions of the consent form.

If you have questions about this notification or using iRIS, contact the HRPP office at (405) 325-8110 or irb@ou.edu. The HRPP Administrator assigned for this submission: Nicole A Cunningham.

Cordially,

Fred Beard, Ph.D.
Vice Chair, Institutional Review Board

Appendix L

Main Study Bronson Piano Performance Achievement Rubric (BPPAR) Student Self-Assessment Form

(Note: Following the pilot study, the main study BPPAR included the following updates: (a) elimination of the “outstanding” achievement level, (b) inclusion of “all of the notes clearly speak and project” within the notes category, (c) inclusion of “correct tempo” within the rhythm and timing category, and (d) inclusion of comment lines for each criterion.)

For each category, please circle the one box that best describes your performance.
Within the comments section, students are encouraged to write specific measures that need improvement, along with other helpful comments.

CATEGORY	Needs Improvement	Okay	Good	Excellent
<u>NOTES</u> <ul style="list-style-type: none"> • Playing the correct notes • All of the notes clearly speak and project 	Correct notes were rarely played.	Correct notes were sometimes played.	Correct notes were often played.	Correct notes were always played.

Note Comments:

<u>RHYTHM AND TIMING</u> <ul style="list-style-type: none"> • Correct rhythms & rests • Steady beat • Correct tempo • Correct use of expressive timings: Ritard. & accelerando 	Correct rhythm and timing was rarely played.	Correct rhythm and timing was sometimes played.	Correct rhythm and timing was often played.	Correct rhythm and timing was always played.
---	--	---	---	--

Rhythm & Timing Comments:

CATEGORY	Needs Improvement	Okay	Good	Excellent
<u>ARTICULATION</u> <ul style="list-style-type: none"> • Staccatos played short & bouncy • Slurs played smooth & connected • Accents played louder 	Articulations were rarely played.	Articulations were sometimes played.	Articulations were often played.	Articulations were always played.

Articulation Comments:

<u>DYNAMICS</u> <ul style="list-style-type: none"> • Big difference between louds & softs • Correct crescendos & diminuendos • Melody is played louder than the other notes (voicing) 	Dynamics were rarely used.	Dynamics were sometimes used.	Dynamics were often used.	Dynamics were always used.
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Dynamic Comments:

CATEGORY	Needs Improvement	Okay	Good	Excellent
<u>STYLE AND MOOD</u> • The performance represents the correct character and emotion of the music.	The style and mood was rarely present in the performance.	The style and mood was sometimes present in the performance.	The style and mood was often present in the performance.	The style and mood was always present in the performance.

Style & Mood Comments:

Student Participant Number: _____

Repertoire Title: _____

Repertoire Composer: _____

Appendix M

Main Study Bronson Piano Performance Achievement Rubric (BPPAR) Expert Assessment Form

(Note: The student BPPAR and the expert BPPAR included the following differences:
(a) the expert form did not include the comment lines following each criterion, and (b)
the student form did not include the score column.)

For each category, please circle the one box that best describes the performance.

CATEGORY	Needs Improvement	Okay	Good	Excellent	Score
<u>NOTES</u> <ul style="list-style-type: none"> • Playing the correct notes • All of the notes clearly speak & project 	Correct notes were rarely played.	Correct notes were sometimes played.	Correct notes were often played.	Correct notes were always played.	
<u>RHYTHM AND TIMING</u> <ul style="list-style-type: none"> • Correct rhythms & rests • Steady beat • Correct tempo • Correct use of expressive timings: Rit. & Accel. 	Correct rhythm and timing was rarely played.	Correct rhythm and timing was sometimes played.	Correct rhythm and timing was often played.	Correct rhythm and timing was always played.	
<u>ARTICULATION</u> <ul style="list-style-type: none"> • Staccatos played short & bouncy • Slurs played smooth & connected • Accents played louder 	Articulations were rarely played.	Articulations were sometimes played.	Articulations were often played.	Articulations were always played.	

<p><u>DYNAMICS</u></p> <ul style="list-style-type: none"> • Big difference between louds & softs • Correct crescendos & diminuendos • Melody is played louder than the other notes 	Dynamics were rarely used.	Dynamics were sometimes used.	Dynamics were often used.	Dynamics were always used.	
<p><u>STYLE AND MOOD</u></p> <ul style="list-style-type: none"> • The performance represents the correct character and emotion of the music. 	The style and mood was rarely present in the performance.	The style and mood was sometimes present in the performance.	The style and mood was often present in the performance.	The style and mood was always present in the performance.	

TOTAL SCORE:

Appendix N

Main Study Recruitment E-mail

Dear parents of piano students,

Your 8-13 year-old children have the opportunity to participate in the main study of my dissertation research, which hopes to provide young pianists and their piano teachers with helpful practice strategies. I am a Ph.D. candidate at the University of Oklahoma and a piano lecturer at Iowa State University. I am in need of 200 pianists, ages 8-13, so I ask you to please consider allowing your child to participate in my research.

If you choose to have your child participate, he or she will perform a piano solo and self-assess their performance on the attached Bronson Piano Performance Achievement Rubric. The piano solo does not need to be memorized, but should be learned to a level that would be suitable to perform for a piano festival, audition, or recital. All of the student participants will be video-recorded for three expert piano judges to later assess the piano performances. Students will be divided into a recall group or video group. The recall group will self-assess on the rubric based on how well they remembered performing. The video group will watch the video of their piano performance to aid their self-assessment on the rubric. Additionally, 12-18 of the student participants will be video taped while completing their self-assessment to provide their thoughts and suggestions on the rubric for its future improvement. *The entire research process should take no longer than 10 minutes.*

As a thank you, students that participate will be entered into a drawing for Target gift cards!

If you and your child choose to participate, research can be conducted in one of the following convenient settings:

1. Piano teacher's studio if they study with one of the following teachers who have completed research training: Janci Bronson, John Devlin, Christy Kiespert, Donita McCoy, Pam Sibbel, Jennifer Tripi, or Luisa Wendt.

Note, if your child's piano teacher collects data from his or her own students, it is especially important that you discuss the study with your child and make certain that he or she feels no special pressure or obligation to be a participant.

2. Ames Piano Festival on Saturday November 21 at ISU Music Hall. Janci Bronson will be conducting the research in her Music Hall office (room 51).
3. Child's home. A parent or guardian is required to be present when Janci Bronson conducts the research at the child's home.

4. Other location. For example, Janci Bronson's Music Hall office on a day other than the Ames Piano Festival, local church, or other location with a good acoustic piano agreed upon by the parent and Janci.

Please read over the attached parental permission and child assent documents and if you and your child choose to participate in this study, please answer the questions on the questionnaire that can be found at the following link.

https://newqtrial2015az1.az1.qualtrics.com/SE/?SID=SV_6yTWzsRL03HiWWN

(Click on the blue link to direct you to the survey. If that does not work, copy and paste the link into your Internet browser.) For parents with multiple children taking piano lessons, please complete a survey for each child.

Please contact Janci Bronson, jlabronson@ou.edu, (cell) 515-XXX-XXXX with any questions or concerns. Thank you for your time and consideration of participating in this research!

Sincerely,

Janci L. A. Bronson
Ph.D. candidate at the University of Oklahoma
jlabronson@ou.edu
Coordinator of Class Piano & Pedagogy
Iowa State University

The University of Oklahoma is an Equal Opportunity Institution

IRB NUMBER: 6120

IRB APPROVAL DATE: 11/10/2015



Appendix O

Main Study IRB Assent Document for Child Participants

701-A-6

Signed Child Assent

Why are we meeting with you?

I am Janci Bronson from the University of Oklahoma. We are doing a research project to study how well young student pianists listen while they play the piano. We want to find out how accurately you think you perform the correct 1) notes, 2) rhythm and timings, 3) articulations, 4) dynamics, and 5) style and mood of the music. Also, some of you will watch a video recording of your piano performance, so we want to see if the video makes it easier to listen and assess your performance. We are asking you to help because we want to learn from kids like you. In the whole research project, there will be about 200 children, ages 8-13 who are taking piano lessons and volunteer to participate.

What will happen to you if you are in this research project?

If you agree to be in this research project, we are going to ask you to play one piano solo, which does not need to be memorized. The piano solo should be learned to a level that would be suitable to perform for a piano festival, audition, or recital. Once you finish playing your piece, you will fill out a form, called a rubric, where you circle answers about how well you think you played the 1) notes, 2) rhythm and timings, 3) articulations, 4) dynamics, and 5) style and mood of the music. Half of the students will also watch a video of their performance on a laptop to help them answer the same questions about how well they think they played. Additionally, 12-18 of the student participants will be video taped while completing their self- assessment to provide their thoughts and suggestions on the rubric for its future improvement.

How long will you be in the research project?

You will be in the research project for about 10-15 minutes. Participation will occur at a variety of locations: a) your piano teacher's studio, b) piano festival, c) your home, or d) other convenient location.

What bad things might happen to you if you are in the research project?

Your Mom or Dad will have to give their permission for you to help me. No bad things will happen to you. The questions might take a bit of time to answer. You might feel a little nervous when you perform, like how you would for a piano recital.

What good things might happen to you if you are in the research project?

You will be entered in to a drawing to win a Target gift card. You might learn of a

Appendix P

Main Study IRB Consent Document

701-A-4

Signed Parental Permission to Participate in Research

Will you allow your child to be involved in research at the University of Oklahoma?

I am Janci Bronson from the music department, and I invite your child to participate in my research project entitled Predictors of Piano Achievement Among Young Pianists. This research is being conducted at various sites: a) your piano teacher's studio if they have completed required research training, b) a piano festival, c) convenient data collection site, or d) the child's home. Your child was selected as a possible participant because they are an eight to thirteen year-old that take piano lessons.

Please read this document and contact me to ask any questions that you may have BEFORE allowing your child to participate in my research.

What is the purpose of this research?

The purpose of this research is to provide young piano students with a way to critically listen and self-assess their piano performance. All of the participants will self-assess a piano solo on a piano performance achievement rubric, which evaluates the accuracy of 1) notes, 2) rhythm and timing, 3) articulation, 4) dynamics, and the 5) style and mood of the music. Additionally, half of the participants will self-assess after watching a video recording of their performance.

How many participants will be in this research?

About 200 piano students will take part in this research.

What will my child be asked to do?

If you allow your child to be in this research, s/he will perform a piano solo and self-assess their performance on a rubric. It is not necessary for the piano solo to be memorized. The piano solo should be learned to a level that would be suitable to perform for a piano festival, audition, or recital. Students within the video group will additionally watch a video recording of their piano performance to assist their self-assessment on a rubric. Additionally, 12-18 of the student participants will be video taped while completing their self-assessment to provide their thoughts and suggestions on the rubric for its future improvement.

How long will this take? Your child's participation will take no longer than 10-15 minutes.

What are the risks and/or benefits if my child participates?

There are no risks from being in this research. Benefits of being in the study are providing your child with a process to critically listen and self-assess their piano performance on a rubric while practicing at home.

Will my child be compensated for participating?

Your child will be entered into a drawing for Target gift cards. The drawing for the gift cards will take place after the 200 student participants have completed the research. Parents of winners will be contacted via e-mail to make arrangements to mail the gift card to student winners.

Who will see my child's information?

In research reports, there will be no information that will make it possible to identify your child. Research records will be stored securely and only approved researchers and the OU Institution Review Board will have access to the records.

You have the right to access the research data that has been collected about your child as a part of this research. However, you may not have access to this information until the entire research has completely finished and you consent to this temporary restriction.

Does my child have to participate

No. If your child does not participate, s/he will not be penalized or lose benefits or services unrelated to the research. If your child does participate, s/he doesn't have to answer any question and can stop participating at any time. Because some student participants may include the unusual step of having a researcher—in this case, your child's piano teacher—recruit and collect data from her own students, it is especially important that you discuss the study with your child and make certain that he or she feels no special pressure or obligation to be a participant.

Will my child's identity be anonymous or confidential?

Your child's name will not be retained or linked with her/his responses. The data will be destroyed at the end of the research.

Please read through all of the following questions and make your responses on the electronic survey linked at the bottom of the recruitment e-mail.

I consent to my child being quoted directly. ____ Yes ____ No I consent to having my child's name reported with quoted material. ____ Yes ____ No

I consent to having the information my child provided retained for potential use in future studies by this researcher. ____ Yes ____ No

Video Recording of Research Activities

To assist with accurate recording of your child's responses, one of your child's piano performances and 12-18 students' self-assessment process will be recorded on a video recording device. You have the right to refuse to allow such recording.

If you do not agree to video-recording, your child cannot participate in this research.

I consent to video recording. ____ Yes ____ No

Will I be contacted again? The researcher would like to contact you again to recruit your child into this research or to gather additional information.

_____ I give my permission for the researcher to contact me in the future. _____ I do not wish to be contacted by the researcher again.

Who do I contact with questions, concerns or complaints? If you have questions, concerns or complaints about the research or have experienced a research-related injury, contact me at 515-XXX-XXXX or jlaborson@ou.edu. Additionally, you may contact the faculty sponsor, Dr. Charles Ciorba at cciorba@ou.edu.

You can also contact the University of Oklahoma – Norman Campus Institutional Review Board (OU-NC IRB) at 405-325-8110 or irb@ou.edu if you have questions about your child's rights as a research participant, concerns, or complaints about the research and wish to talk to someone other than the researcher(s) or if you cannot reach the researcher(s).

You will be given a copy of this document for your records. By providing information to the researcher(s), I am allowing my child to participate in this research.

Parent's Signature

Child's Name

Signature of Researcher Obtaining Consent

Signature of Witness (if applicable)

Please check one of the following locations where research will be conducted with your child. Thank you!

_____ Piano teacher's piano studio. This may only be selected if your child studies with one of the following teachers: Janci Bronson, John Devlin, Christy Kiespert, Donita McCoy, Pam Sibbel, Jennifer Tripi, Luisa Wendt.

_____ Ames Piano Festival, Saturday November 21, ISU Music Hall. Janci Bronson will e-mail to arrange a time.

_____ Child's home with the presence of a parent or guardian. Janci Bronson will e-mail to arrange a day and time.

_____ Other location. For example, Janci Bronson's ISU piano studio, local church, or another location to be agreed upon by the parent and Janci Bronson.

Revised 03/01/15

IRB NUMBER: 6120

IRB APPROVAL DATE: 11/10/2015

IRB EXPIRATION DATE: 10/31/2016



Appendix Q

Main Study Qualtrics Consent Questionnaire

I consent to my child being quoted directly.

- ☐ Yes
- ☐ No

I consent to having my child's name reported with quoted material.

- ☐ Yes
- ☐ No

I consent to having the information my child provided retained for potential use in future studies by this researcher.

- ☐ Yes
- ☐ No

I consent to having my child's contact information retained after the study so that she/he can be contacted to participate in future studies.

- ☐ Yes
- ☐ No

I consent to video recording.

- ☐ Yes
- ☐ No

I give my permission for the researcher to contact my child in the future.

- ☐ Yes
- ☐ No

I have read the consent document attached to the recruitment e-mail. I have asked questions and have received satisfactory answers. I consent for my child to participate in the study. If you consent to have your child participate in this study, please type the appropriate information in each of the below boxes.

- ☐ Parent's Full Name _____
- ☐ Child's Full Name _____
- ☐ Date _____
- ☐ Child's Gender _____
- ☐ Child's Age _____
- ☐ Child's number of years taking piano lessons _____
- ☐ Parent's E-mail Address _____
- ☐ Parent's Phone Number _____
- ☐ Piano Teacher's Name _____

Please check one of the following locations where research will be conducted with your child. Thank you!

- ☐ Saturday March 5 OMTA Moore/Norman District Achievement Auditions at OU Catlett Music Center, Room 018.
- ☐ Piano teacher's piano studio. This may only be selected if your child studies with one of the following teachers: Janci Bronson, John Devlin, Christy Kiespert, Donita McCoy, Pam Sibbel, Jennifer Tripi, Luisa Wendt.
- ☐ Ames Piano Festival, Saturday December 19, ISU Music Hall. Research will be conducted within Janci Bronson's ISU Piano Studio, Music Hall room 51. Janci will e-mail to arrange a time.
- ☐ Child's home. A parent or guardian is required to be present. Janci Bronson will e-mail to arrange a day and time. Please enter your address below.

- ☐ Other location. For example, Janci Bronson's ISU piano studio, local church, or another location to be agreed upon by the parent and Janci Bronson. A parent or guardian is required to be present. Please enter your suggested location below.

This question should be answered by your child:

By typing your name below, it means that you have read the student assent document and want to be in the study. If you don't want to be in the study, don't type your name below. Being in the study is up to you, and no one will be upset if you don't type your name below or if you change your mind later. Please fill out each of the below boxes if you want to participate in this study.

☐ Child's Full Name _____

☐ Date _____

By typing your name below, you are verifying that you have explained the study to your child in language he/she can understand and the child has agreed to be in the study. Please fill out each of the below boxes if your child has agreed to be in the study.

☐ Full Name of Parent Conducting Assent Discussion _____

☐ Date _____

You may print a copy of this survey with your responses to keep for your records. Thank you!

Appendix R

Main Study Data Collection Script for Key Study Personnel

RECALL GROUP

Does NOT watch their performance on video, but assesses based on their memory of how well they remembered performing.

1. Give the student one Bronson Piano Performance Achievement Rubric.
2. Double-click on the Rubric Explanation audio recording on the computer desktop and play for the student. While listening to the explanation recording, please point to the various spots on the rubric that Janci explains to help the student.
3. Double-click on QuickTime Player, which is on the computer dock.
 - - Choose File: New Movie Recording.
 - - For best viewing, choose View: Enter Full Screen.
 - - To video-record, select the red record button on the bottom part of the video screen (it will appear when you move your mouse over the bottom part of the video screen).
 - - Video-record the student performing one piano solo. Solo should be learned to a level appropriate to perform for a festival, audition, or recital. Memory is not required.
 - - To stop recording, select the black record button. If needed, push the escape button to exit the full screen.
4. Immediately following the performance, have the student look at the rubric again and look over their music carefully to notice all the details. Do NOT play the performance video back for the students in the Recall Group.
 - - On the rubric, have the student circle the ONE box that best describes their performance for each category of notes, rhythm and timing, articulation, dynamics, and the style and mood.
 - - Encourage them to write comments below each category.
5. Please thank them for participating!
6. For every video, choose File: Save: # (Student's specific participant number provided by Janci) and Repertoire Title. For Example, #25 Arabesque. Save the video recording to the desktop. At the end of a lesson day, please drag the videos to the folder on the desktop: "Bronson Main Study Videos."

VIDEO GROUP

Following their performance, DOES watch their performance on video to assist their self- assessment.

1. Give the student one Bronson Piano Performance Achievement Rubric.
2. Double-click on the Rubric Explanation audio recording on the computer desktop and play for the student. While listening to the explanation recording, please point to the various spots on the rubric that Janci explains to help the student.
3. Double-click on QuickTime Player, which is on the computer dock.
 - - Choose File: New Movie Recording.
 - - For best viewing, choose View: Enter Full Screen.
 - - To video-record, select the red record button on the bottom part of the video screen (it will appear when you move your mouse over the bottom part of the video screen).
 - - Video-record the student performing one piano solo. Solo should be learned to a level appropriate to perform for a festival, audition, or recital. Memory is not required.

4. Immediately following the performance, have the student look over the rubric and then watch their music to carefully notice all the details while they listen/watch their video-recorded performance.

- - Make sure the volume is at an appropriate level by clicking the F12 (louder) or F11 (softer) buttons.
- - The student may listen/watch the recording up to 2 times.
- - On the rubric, have the student circle the ONE box that best describes their performance for each category of notes, rhythm and timing, articulation, dynamics, and the style and mood.
- - Encourage them to make comments below each category.

5. Please thank them for participating!
6. For every video, choose File: Save: # (Student's specific participant number provided by Janci) and Repertoire Title. For Example, #25 Arabesque. Save the video recording to the desktop. At the end of a lesson day, please drag the videos to the folder on the desktop: "Bronson Main Study Videos"

IRB NUMBER: 6120

IRB APPROVAL DATE: 11/10/2015